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FEBRUARY 18, 1943

The

## IRON AGE



Absentees win no wars, on the fighting front or the production front. To be "on deck" every day is the first obligation of every one of us, executive, machine operator, and office worker alike. To say, "I don't feel like working today" is little different from a soldier's saying, "I don't feel like fighting today." Keep fit and keep fighting!



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## THE IRON AGE

#### Editorial

#### **Technical Articles**

Layout Tables Speed Work on Turret Punch Presses	47
Induction Hardened Parts Make Wear Record	53
Clad Steel "Sandwiches"	54
Pilot Light Minimizes Error in Process Lathe Work	59
Near Infra-Red	60
Preparation of Hardened Surfaces for Metallizing	62
An Ingot of Rimmed Steel Examined	65
Porcelain Enameling of Aircraft Exhausts	66
New Standard Simplifies Ordering & Matching Colors	72
Universal Drill Fixture Saves Day per Week	73
New Equipment	74

#### Features

Assembly Line	 			. 78
Washington	 			. 82
West Coast				
Fatigue Cracks				
Dear Editor				92

#### News and Markets

This Industrial Week	94
News of Industry	97
Personals and Obituaries	137
Machine Tool Activity	138
Non-Ferrous Metals	
Scrap Markets	142
Iron and Steel Scrap Prices	144
Comparison of Prices	
Finished Steel Prices	

Index to Advertisers .....

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# THE IRON AGE

**FEBRUARY 18, 1943** 

**ESTABLISHED 1855** 

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### Say "Yes Sir"...But Don't Like It!

NE of the common objectives for which capital, management and labor can work together is the preservation of individual initiative.

In a regimented economy such as we are now approaching under the spur of war and which some of our bureaucratic brethren hope to continue after the war, initiative is a monopoly. It is taken from the individual and put in the hands of the few unelected and sometimes voterrejected, white-haired boys who supplant initiative with administrative orders.

In time of war, this situation is bearable in view of the stakes. We can't expect to do as we please but must do as we're told by the new "ruling class" that war puts into the saddle. So as war goes on, the lines become more distinctly drawn between the minority who issues the orders and the vast majority who accepts them with a "yes sir!"

This transition from a peacetime democracy to a wartime absolute oligarchy does not happen all at once. It approaches in waves.

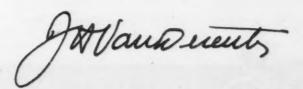
First engulfed by absolute authority are, of course, the selectee's who form our fighting forces. For them, the exercise of individual initiative is out for the duration.

Next to be engulfed by the authoritarianism of war are capital and management. They have been under the yoke for many months now and have learned how to say "yes sir" even if they have not learned to like it.

The "rights of labor," of which we hear so much, are the last to be inundated by the rising tide of war regimentation. But even they are not immune and labor is now beginning to get its feet wet and shortly will be as submerged in "orders" and as deprived of individual initiative as the rest of us are. Manpower Commissioner McNutt will see to that in the course of his duties and even the most powerful of our labor leaders will then find the union card far outranked by a manpower work ticket.

Yes, all of us are going to have to surrender our individual rights as well as a large part of our individual earnings in the cause of victory. All of us will have to learn how to say "yes sir." But we don't have to like it! If we did, there would be no hope for us in our post-war world and we and our children would probably go through life with ration books and work orders pinned to our shirts, if we had any left to wear.

Pray God that while enduring it now during war, we will dislike it so much that capital, labor and management will unite to see to it that after the war our individual freedoms are returned to us undamaged from the hands to which they have temporarily been entrusted.





## The Steel Necessary to Replace It Must Be Sent to a Battle Front

The government has allotted a limited amount of steel for essential maintenance, but any part of that steel saved by repairing instead of replacing—is that much more steel for ships, tanks, guns, etc.

Much critical war steel now used for repairs and replacement of broken and worn parts can be saved if periodic inspections are made to discover failures in their early stages. Welding can be employed to rejoin broken parts, and to reinforce parts that show the effects of strain. Often times steel parts, and equipment, bent and twisted by accident, can be heated and straightened and put back into service, saving the new steel necessary for replacement. Steel

damaged by localized corrosion can be cut away with a torch and replaced, sometimes with scrap pieces of metal, saving replacement of the entire member.

There are practical methods for building up worn shafts, and other parts worn by friction. Very often a few vital parts of old machines can be reinforced with the minimum use of new steel, and the machines put back into service for heavy duty work.

All the new steel that America can produce has a vital place in the scheme for defeating our enemies. Do your part in the fight for freedom by using the minimum of new steel for maintenance.

Repair it! Don't replace it!



## Layout Tables Speed Work

### On Turret Punch Presses

TURRET punch presses themselves have been used for many years for piercing work in lots from 1 to 100 pieces. Recent innovations in spacing table equipment for such punch presses have extended the range up to as many as 1000 or more parts per run. A wide variety of such equipment has been developed, each suited for a particular class of work, size range or tolerance limitation on

location of holes.

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nsas City

By THEODORE A. WIEDEMANN lice-President, Wiedemann Machine Co., Philadelphia

Except for turret punch presses designed for piercing through templates, all the spacing tables are arranged to space the holes by a system of "X" and "Y" coordinates measured from a selected corner of the flat sheet. Variations in the equipment come about in the method of supporting the work piece and in traversing the work holder or even the machine itself for obtaining coordinate movement. Other differences are in details of traverse movement-by rack and pinion or lead screws, and the various methods of measuring or gaging the settings obtained. Choice of such details depends upon the accuracy required and the size of sheet. It is possible to obtain accuracy of hole spacing within 0.002 in. on certain types.

#### Turret Construction

The turret punch press was developed expressly for economical short run piercing work on flat stock. Essentially it is a machine in which from eight to 32 different size or shaped die sets are located in a rotary turret. Only one punch and die set is operative at any one time, this being the one directly under the ram. To change punch sizes, the turret is in-

. . . New developments in laying out and gaging hole spacing in sheet metal and light plate are putting a fresh emphasis on the use of turret punch presses for perforating aircraft and ordnance components where the production runs are too low to warrant more expensive die engineering.

dexed by hand (or by power in the larger machines) until the desired punch size is in working position. Then the press is tripped. These machines range in size from hand operated units of  $7\frac{1}{2}$  ton capacity up to 80-ton units capable of punching a 2-in. hole in  $\frac{1}{2}$ -in. plate.

Fig. 1 shows a typical arrangement of strippers and punches in a small turret of 10 in. pitch diameter. For the first five stations punch sizes can run up to 1¼ in. and in stations 8 to 11 between 2 and 2¼ in. Stations 6 and 7 take punches from 1½ to 2 in. By using large diameter turrets (up to 54 in.) it is possible to get in as many as 32 stations with any desired size variations between punches. These punches need not be limited to round shapes, but can be square, oblong or any other variation within the maximum diameter of the punch circle.

In semi-production work, such as on radio panels, where a variety of sizes and shapes of holes are to be perforated in a sheet, all the punches necessary for this run are incorporated in the turrets of the press. Any special punches can be removed at the end of the run and be replaced with standard punches in a short time.

Where two or more holes are close to each other and have to have the spacing rigidly controlled, it is standard practice to set up multiple punches in a single die set.

#### From 8 to 32 Die Stations

One of the advantages of the turret principle is that there is instantly available from eight to 32 subpress die set-ups. Hence, not only is changing punch sizes reduced to a matter of seconds, but damage to die set occasioned by handling them in and out of the press and in the racks is eliminated.

Punches and dies are simple and inexpensive, being made up of high carbon steel, hardened and ground in the usual way. The holders are a heat treated chrome vanadium steel. Strippers are an integral part of the punch holders and are mounted close to the dies so that a short stroke (% to 1 in.) is employed. With a crank or eccentric speed of 80 to 120 strokes per min., this results in a low punch speed in feet per minute, with corresponding reduction in shock on the tools and work. Power requirements are low. A 3-hp, motor for example, is used on the 40-ton machine.

Wiedemann Machine Co. has developed to a high degree material positioning equipment to be used in conjunction with its turrent punch

THE IRON AGE, February 18, 1943-47

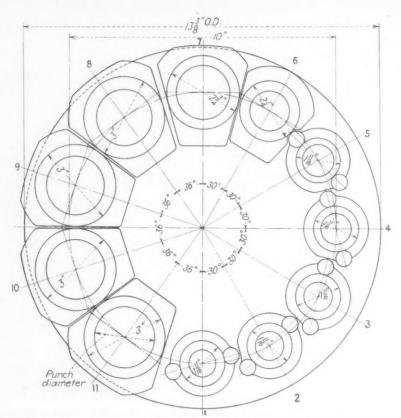


FIG. 1—Layout of punches in 11-station turret. The biggest Wiedemann turret made has a 42-in. pitch diameter circle and accommodates up to 32 punches, depending upon the diameter of each.

presses. These recent developments came as a result of the demand for equipment that would eliminate or reduce both the time required to lay out the first piece and the time to set up cumbersome and awkward stops. The gaging arrangements are fast and simple, but at the same time are made to function as universally as possible to fit in with the application of the equipment to short run jobs. This assures a constant flow of work through the machine with the least amount of lost time and gage set-up. Some spacing tables and gages are adaptable for runs as high as 800 to 1200 pieces; while still other types are most suitable for work of extremely large area which would normally require two or three men in the handling of the material alone.

#### Laying Out Coordinates

How the system works in laying out X and Y coordinates is best illustrated in Figs. 2, 3 and 4. These drawings show how five rather complicated steel and aluminum components can be perforated with a single turret punch having 24 stations. Of these, 11 carry special punches as shown in Fig. 4, and 13 carry circular punches varying from 0.390 to 6% in. in diameter as indicated in the table in Fig. 4. Sta-

tion No. 19 has three interchangeable punch and die sets for 5½, 6 and 6¾ in. punches, respectively. All stations in the turret have this interchangeable feature.

These drawings are dimensioned in the conventional way. Hence when using the coordinate system of layout from the upper left hand corner of the plate, it is advisable to prepare a chart for the machine operator giving the X and Y dimensions from the reference corner. These data are listed in the form of a chart or operation sheet, as illustrated in Fig. 3. It would also be possible to show all dimensions to center of punch on the drawing from the X and Y base lines as is done in dimensioning for jig borer work. Standard time for doing each of these jobs is shown beside each part sketch and is broken down into elements for the main piece E to show the set-up time and the individual perforating operations.

Work of this nature involving large area plates and unusually large die sets, is done on a machine with direct reading layout table and gage, such as is shown in Fig. 5. The particular machine shown is for another job and is a 50-ton machine which is ordinarily capable of punching a 5-in. hole in

a 1/8 in. mild steel plate or a 6-in. hole when sheared punches are used.

#### Direct Reading Layout Table

The machine pictured in Fig. 4 has a spacing table capacity to handle sheets or light plate up to 50 in. wide and 120 in. long. The sheet or plate is positioned by bringing one end against a fixed stop and one edge against the back of the work clamps which securely hold the piece so that it can be moved either in or out or longitudinally and still remain in its original relationship with the measuring devices. All dimensioning is done from the end set against the clamps and the end against the end stop. The three quick acting clamps shown are adjustable along a top slide. This slide can be moved back and forth for X coordinates. The entire measuring beam on which the slide is mounted is carried on tracks at each end.

Both the measuring beam and the top slide are carried on anti-friction rollers for ease of movement and traverse in either direction by rack and pinion motion and handwheels. In the photograph, one of the slide racks can be seen bolted to the table track. The corresponding rack on the other rail is 170 in. away, assuring accurate alinement of the table. Settings are made with the aid of full length scales, with large graduated dials on the handwheels for final accuracy. A clamp lever is used to hold the beam in position after setting.

This particular machine has a 52-in. turret and a 54-in. throat. Punch centers are on a 42 in. pitch diameter circle. The turret indexing lock and switch are operated by a single lever at the front of the table and to the right of the operator who stands on a platform which moves in and out with the table. To his left is a clutch lever for initiating the punching cycle.

#### Standard Gage

The simplest and least expensive of the gaging arrangements, Fig. 6, provides adjustable material supports and a rear gage bar which is moved in and out parallel to the centerline of the machine by means of two lead screws. These lead screws are operated by a handwheel at the front of the machine. A graduated collar assures accurate settings.

The gage bar is graduated each way from the center in 32nds and one or two end stops are provided which are adjustable and can be securely locked against movement. The adjustable stops provide locating points for cross dimensions, but they must be reset for each cross dimension. Hence with this arrangement it is the practice to pierce all the holes for a particular X-dimension before resetting the stops.

#### Double Bar Direct Measuring Table

Fig. 7 shows what is called a double bar direct measuring table. Designed to handle pieces from 8 x 8 in. to 54 x 72 in., this gaging arrangement differs from the direct reading gage and table shown in Fig. 5 in that it is suited for small work and work where it is not possible to use clamps for holding the job. The work is dropped into a frame which encloses the work

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on its four edges. This frame is quickly adjustable and eliminates all clamping. Once the frame is locked to the desired size, subsequent pieces can be dropped into it and run through the press without further adjustment.

The left rear corner of the frame is the dimensioning point for laying out the work and when the direct reading dials are both at 0, this point of the frame coincides with the centerlines of the punch and die under the ram. The general operation is similar to the spacing gage and table just described, all dimensions being read from a chart and the handwheels set to correspond. One handwheel moves

the table in or out by means of a rack and pinion, well below the table top. The table is mounted on ball bearing V-grooved wheels running on tracks so that parallel movement is assured.

The adjustable frame is moved crosswise on the table also by means of rack and pinions. The top of the table consists of a series of rolls mounted in ball bearings which reduces friction between the frame and table.

#### Pin Type Gage

The pin type gage, Figs. 8 and 9, is well suited for short runs where the average lot varies from one to 50 or 100 pieces of a kind. It consists of

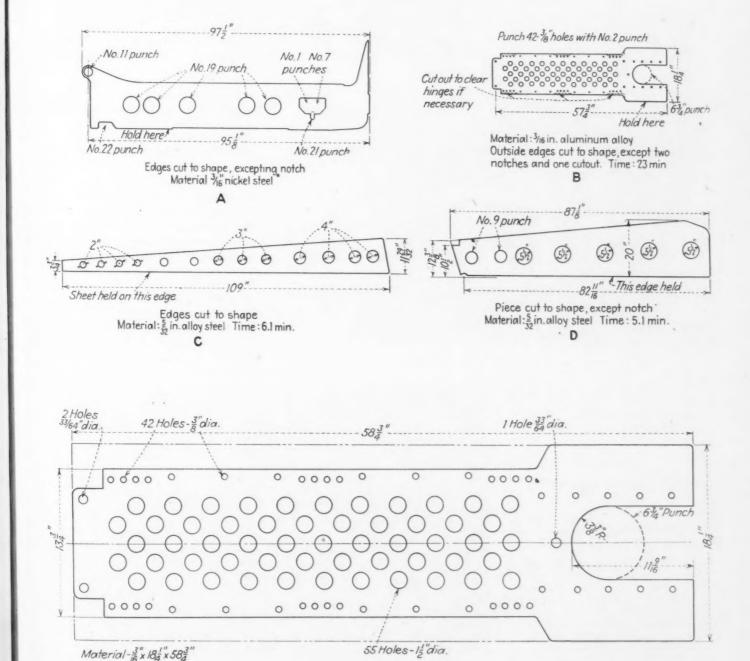
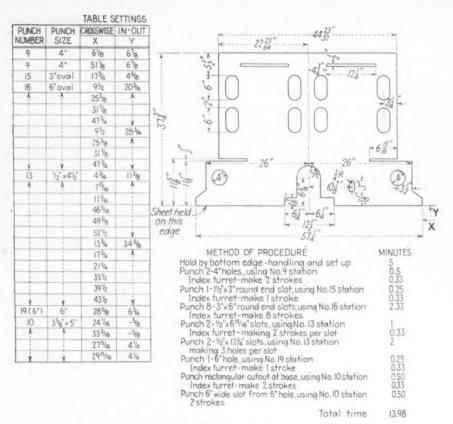


Fig. 2—These four related pieces plus the one shown in Fig. 3 are pierced by tools contained in one 24-station turret punch press.



F IG. 3—Typical method of charting the spacing holes on a direct reading layout table, using X and Y coordinates. Punch numbers refer to those shown in Fig. 4.

. . .

FIG. 4—Odd shaped punches and table of round punches in the 24-station turret used to perforate the five parts shown in Figs. 2 and 3.

ROUND PU	NCHES	, i	3"		2½"
NO. 1	DIAM.	21	, V16		
2 (	0.390"	4/5×	7"	X	
4	3"	2 2		CONCE	- 232" > 29"
6	5/8"		3/1"	¥	
8	13/4"	201	" / -	22">	7"
9	4"	No.21		No.23	32
11	23/4"	No.2	22		
12	214"	×3">	Heel punch		
14	2"			-	No.1
17	11/2"	7	25		
18	33/64"	No.3	32		4 <sub>4</sub> ">
	51/2"				
19	6"	21" 21"	-> No.5		No. 13 = in
	63/4"	A	7 _	,	
20	3/8"				
24	1"	$2\frac{9}{32}$ $-2\frac{9}{32}$			
1		25."		10	
		-> -7"	/	73"	
, m	- 11	32/	1	58	
1-12	1"->			¥	3"
1		¥		No.10	
No.1	5	No.7			
					No.16

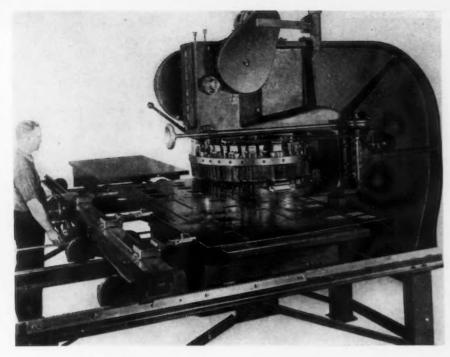
a back gage bar operating in and out at right angles to the centerline of the machine and controlled by a conveniently located handwheel. This turns two lead screws on either side of the press. Direct reading dials give the Y-coordinate centerline distances of the openings to be pierced. The work is placed against the gage and right angle end stop, thus gaging all dimensions from the rear left corner. For the X-coordinate the gage bar is moved laterally through a pair of flanged friction rolls on each side of the turret.

As seen in the close-up view, Fig. 9, a series of holes is drilled in the gage bar on 1/8-in. centers-four rows across and each spaced 1/8 in. beyond the preceding hole. The first hole is drilled at 0, and the gage bar is graduated from 0 to any required length. By dropping pins with heads of various diameters into these holes, any dimension down to increments of 1/32 in, can be obtained. This arrangement permits the setting up of stops not only for a series of holes in one centerline, but also on several centerlines. Occasionally 40 or 50 pins may be in the gage bar at one time. To eliminate any confusion, the pins have hollow heads filled with various colored oilproof paint-a different color is used for each centerline.

Four fingers or stops pivoted between the flanges of one of the upper guide rollers function for each of the four rows of holes in the gage bar. The pins stop against these fingers, thus providing the correct location for the material corresponding to each pin stop. By raising the fingers and applying a slight side pressure to the material, the gage bar and the material slide toward the left. On releasing the fingers the next pin engages its finger and stops at the proper location. Either a small hand lever or foot trip raises or releases the fingers.

#### Rack Type Gage

The rack type gage, Fig. 10, provides a rapid gaging arrangement with maintained accuracy for continuous piercing operations on longer runs up to 1000 pieces as well as lots as low as 25. Cross dimension is obtained by two racks mounted face to face and extending out to the left of the machine. Stops are provided to drop into the racks, having correspondingly cut teeth, and having a disappearing spring stop. By turning the stop around, dimensional increments of 1/16 and ½ in. are obtained. Other stops provide for 1/32-in. increments.



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F 1G. 5—Direct reading table and gage applied to a Wiedemann type R-8 turret punch press with 32-station turret and 54 in. throat. Flat work up to 50 x 100 in. can be perforated on a layout table of this type.

Any required number of stops can be set up between the facing racks for series punching on the same centerline or on various centerlines, with a minimum of ½ in. on center dimensions. On the front bar is a graduated scale for quick setting of stops to whatever length is required. Movement of a rear gage bar at right angles to the machine centerline is controlled by a handwheel and two synchronized lead screws. The readings

for the Y-coordinates are made on a double dial, one dial reading in fractions, and the second dial giving the dimensions in inches and quarter-inch divisions. This is similar to the arrangement for the pin gage, shown in Fig. 5.

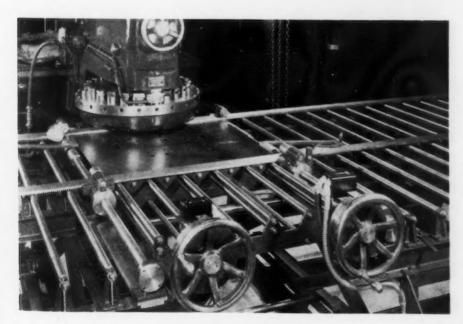
The sheet or plate is placed on a supporting table at the left, forcing all spring pins down, and is held against the gage bar. The work is then slid toward the machine until the first stop is cleared, allowing the pin

0 0 0

#### BELOW

FIG. 7—In the double bar-spacing table, adjustable stops provide locating points for cross dimensions and they must be reset for each X dimension. Lead screws control the in and out movement of the gage bar for the Y coordinate.





to spring up and provide a stop against which the material can be held. The racks and teeth on the stops provide extremely fast gage set-ups and are positive insurance against slipping or shifting.

#### **Punching Through Templates**

On sheet metal parts where the quantities are comparatively large and tolerances on piercing operations are rigid, higher output than is ob-

0 0 0

#### LEFT

FIG. 7—In the double bar-spacing table, the work piece is dropped in a frame which encloses it on four edges. The left rear corner is the zero point for laying out X and Y coordinates, all dimensions being read from a chart.

THE IRON AGE, February 18, 1943-51

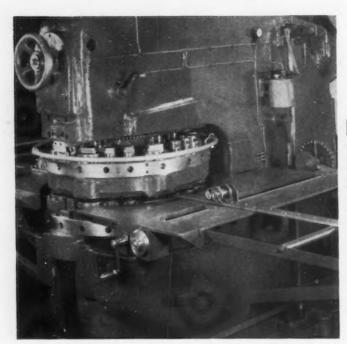


FIG. 8—Pin type gage applied to a type R-6 turret punch press. Dial at rear right shows Y coordinate in inches while fractional inches are read on dial immediately to right of hand crank for lead screw.

0 0 0

time is from a manufacturer of radio equipment who uses this method:

each hole ...... 3.5

The particular machine illustrated in Fig. 11 has a capacity of 12 tons and will punch 1½-in. diameter holes in ½-in. metal. Clearance between dies and strippers is 7/16 in. and stroke of ram only 5% in.

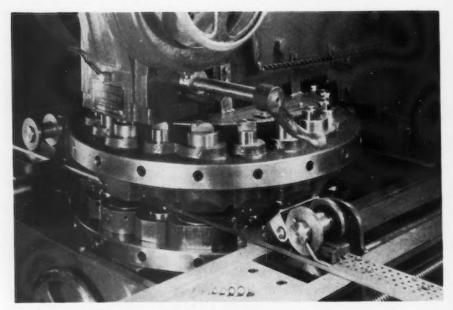
#### Micro Turret Punch Press

The micro-turret punch press, Fig. 12, was developed to produce extremely accurate work such as templates, experimental pieces, drill jigs, etc. This machine is capable of maintaining hole center distances of ±.002 in.

tainable with a spacing type table machine can be obtained by punching through templates. Holes are carefully drilled or punched in a steel template sheet to which the work piece is clamped at the four corners. The machine designed for this operation, Fig. 11, incorporates a two-stage stroke of the punch that assures that the punch is accurately lined up with the template hole before the stroke can be completed. The first part of the stroke is hand actuated.

This machine has a cam on the eccentric, which in turn operates an arm on the up stroke of the press. The action of the cam causes the pitman to be thrown out of engagement with the ram which is permitted to drop to a predetermined point, approximately 1/16 in. or less above the template. The punch is sighted above the hole in the template and is lowered into it by means of a short hand lever in the front of the machine. The punch enters the template and at a predetermined depth trips the press by means of a micro-switch and solenoid which engages the clutch. This safety arrangement eliminates the possibility of the operator piercing the template itself by error-a frequent cause of delay and expense. The entire clutch is interlocked with the index pins so that the turrets must be indexed and locked in position before the press can be tripped.

There is a ¼-in. adjustment on the ram stop, which permits setting the ram for material from ¼ in. thick down to the thinnest material, using a % or 3/32-in. thick template. The



F 16. 9—Close-up of pin gage on a type R41P turret punch press, showing the four rows of holes in spacing bar for pins and the contacting fingers for each row.

second adjustment is incorporated in the micro-switch, so that the press can be tripped at any depth in the template that the operator desires.

The final drive from the motor is through a toothed clutch which is operated from the small hand lever that also lowers the punch and controls the micro-switch. Since only one short motion is required for both locating the punch in the template and tripping the press, the number of holes punched per minute is greatly increased and the pace can be maintained for long periods without operator fatigue.

The following table of standard

over a distance of 28 in. The work piece is rigidly clamped to a slide bar which is moved back and forth in the

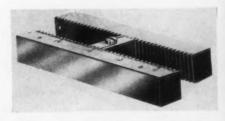


FIG. 10—In the rack type gaging table, the cross dimensions of holes are spaced by stops dropped in between two parallel rack bars at the front of the spacing table. The photograph shows a short section of the rack, which is 6 ft. or more in length.

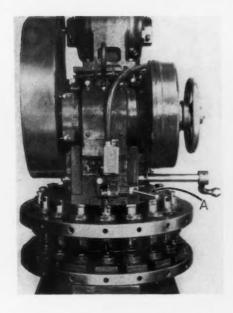
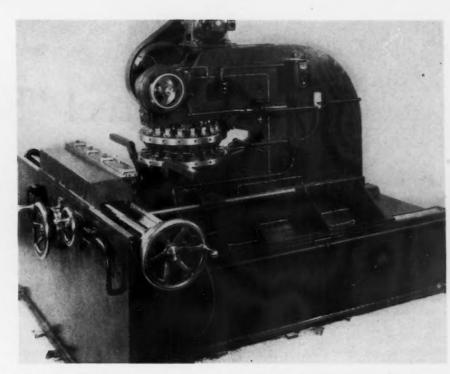


FIG. 11—On this special turret punch press for piercing through templates, one motion of the hand operates lever A which lowers the punch through the template and trips the press at a predetermined point below the surface of the template. Danger of piercing the template itself is thus avoided.

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F 1G. 12—Center distances on perforations can be held within ± 0.002 in. when the eperations are performed on this micro-turret punch press. For laying out the Y coordinates the entire press is moved in and out on a sub-base, while the X coordinates are obtained by moving the slide bar to which the work sheet is clamped.

X-coordinate direction by means of an accurate lead screw and graduated handwheel dial. This slide moves on a flat and V-way. Movement for the Y-dimension is obtained by sliding the entire punch press in and out on V-ways on the sub-base. This movement is controlled by another handwheel and dial located in the front of the cross slide base. Power traverse is supplied for both coordinate movements.

To illustrate the speed of this machine in producing master templates, 93 openings consisting of 16 different diameters were pierced in 41 min. in a template measuring 23 x 34 x  $\frac{1}{16}$  in. To lay out a similar template, center punch, drill and bore to size, maintaining the same accuracy of  $\pm 0.002$  in., previously required about  $10\frac{1}{12}$  hr.

#### Induction Hardened Locomotive Parts Make Wear Record

I N checking the engine parts of a fast streamliner diesel locomotive recently, after it had piled up a million miles of service, it was found that the wear on the crankpins was only 0.001 in. The surfaces

of the crankpins and bearings, and the crankshaft had been selectively hardened by electrical induction, by the Ohio Crankshaft Co.

The process used to harden huge locomotive crankshafts is essential-

ly the same as that used for smaller parts, such as armor piercing shot. Below is a crankshaft in a tunnel line, at the control board. Depth, width and structure of the hardened area are accurately controlled.



## Clad Steel "Sandwiches"

HERE are many applications of corrosion resistant metals where such superior properties are required on the surface only and often on only one surface. Since corrosion resistant materials are relatively scarce, economy has been effected by developing combinations of these expensive metals. such as copper, nickel and stainless steel with ordinary steel plate. Such

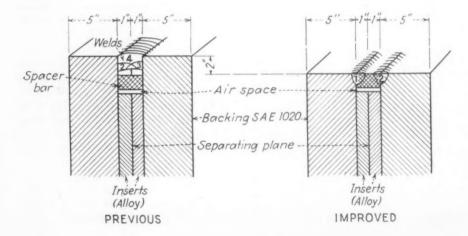
composite plates or sheets are customarily referred to as clad metals.

The most recent figures available indicate that the present production of stainless clad is but a small proportion of the overall picture. In 1941, for example, the production of stainless clad steel was approximately 8,000,000 lb. as compared with a production of solid stainless steel in sheet and plate form of 800,000,000 lb. On the other hand, a far greater proportion of the total production of stainless steel could be used in clad form and, as a matter of fact, its production was increased in 1942 and will no doubt be increased to an even greater extent this year. Whereas many products are being produced in great quantities at the present time because of the war, stainless clad should continue to grow indefinitely because of the sound economics of clad materials.

One of the several effective methods of producing clad metals is the "assembly" method.\* A pair of

\*A description of the Pluramelt process for making armored steel may be found in the March 6, 1941, issue of THE IRON AGE, page 35.

plates of corrosion resistant material, with a separating medium between them, is "sandwiched" between two relatively thicker mild steel backing slabs, Fig. 1. These mild steel slabs are also relatively longer and wider. In the resulting gaps around the edges of the sand-



#### ABOVE

FIG. 1—Partial cross-sections of one edge of the composite plate sandwiches. Assemblies as shown here are peripherally welded to hold the components together, heated to approximately 2250 deg. F. and then rolled on the conventional plate mill. After rolling and necessary sub-processing, the rolled plate is sheared into the separating plane, resulting in two clad plates.

#### RIGHT

FIG. 2—Since the assemblies weight as much as 25,000 lb., a four-post gantry which moves on rails was developed to traverse the automatic welding head along the work. The unit has a travel of 60 ft. and cross beams are arranged so that they may be adjusted transversely and perpendicu-larly within the frame.

#### ON OPPOSITE PAGE

IG. 3—Slabs up to 42 in. wide are easily positioned at the required 6 deg. angle necessary for carbon arc welding in these spe-cially designed troughs. Larger slabs are set up in a reinforced concrete pit.



54-THE IRON AGE, February 18, 1943

#### Welded by the Carbon Arc . . .

By T. S. FITCH

President

and L. W. TOWNSEND

0 0

Vice-President Composite Steels, Inc., Washington, Pa.

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wich are placed spacer bars of the same analysis as the backing steel. The assembly is then peripherally welded to hold the components together and to occlude furnace gases during heating. After welding, such an assembly is heated to approximately 2250 deg. F. and then rolled on the conventional plate mill. After rolling and necessary sub-processing, the rolled plate is sheared into the separating plane, resulting in the two clad plates.

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Since the assembly must be reduced as much as 20 times, it is obvious that the welds must have great strength at elevated tempera-The method of welding originally employed required deep welding grooves. These grooves were effected by making the backing plates considerably longer and wider than the inserts and spacer bars combined. These grooves had to be at least 34 in. deep and on very heavy assemblies as deep as 21/2 in. Then the welding groove was completely filled with weld metal. Obviously very substantial amounts of weld metal had to be

... With emphasis today on conservation, stainless clad steel is gradually coming into its own. Among the several effective methods of producing clad metals is the "assembly" method, described in this paper, which was recently awarded a \$500 prize by the James F. Lincoln Arc Welding Foundation in its \$200,000 progress award program.

deposited. In addition, the weld metal was simply laid into the groove and did not necessarily effect a deep penetration into the backing steel.

In the fall of 1940, the Lincoln Electric Co., held a series of lectures on welding, during which reference was made to carbon arc welding equipment. At that time, it occurred to the writers that this system might be applied to clad assemblies to good advantage. Instead of depositing an appreciable amount of weld metal, it would be possible simply to melt the components and replace the oxidation loss with a relatively small amount of filler wire. Further, the size of the backing plates could be reduced to

the extent that the edges of the backing plates would be even with the outside face of the spacer bar rather than extending considerably beyond. It also seemed logical that a superior weld might be effected since considerably more penetration could be obtained with the carbon arc weld than had been effected previously. The former method employed was not fast, especially on heavy slabs, whereas the carbon arc welding was not only faster, but it was possible that one pass would serve where two, three, or four passes had been utilized previously. Inasmuch as the amount of metal deposited and the time required would be cut down, it followed that the welding cost should

Reference to Table I substantiates expectations as to the savings in weight and, therefore, the increase in yield. In Table II there is presented a breakdown of the costs in connection with the carbon arc welding system now employed. In Table III is given a comparison of welding methods based on estimates of the previous welding costs, since exact figures were not available.

#### Test Assemblies

After some trial assemblies had been carbon arc welded in an outside shop, a Lincoln twin Electronic Tornado carbon arc welder and two 400-amp. generators were installed. The machine was designed to operate with ½ in. diameter carbons, and was a tractor type. Since the welder weighed some 400 lb. and the slabs ran up as high as 25,000 lb., it was decided that it would be more economical to make the weld-



TABLE Typical Savings In Weight Obtained by Use of Automatic Carbon Arc Weld

Former Size,	Present Size,	Former Weight,	Present Weight,	Saved
In.	In.	Lb.	Lb.	Per Cent
2½ x 31 x 50	2½ x 30 x 50	1,115	1,060	4.95
3 x 28½ x 52½	3 x 27 x 51	1,270	1,170	7.90
5 x 34¾ x 58	5 x 32¼ x 55¾	2,870	2,550	11.12
½ x 37 x 58½	7½ x 34 x 55½	4,620	4,010	13.20
10 x 35¾ x 44¾	10 x 32¾ x 41½	4,565	3,840	15.90
15 x 36 x 48	15 x 32 x 44	7,350	5,975	18.70
20 x 47 x 62	20 x 42 x 57	16,500	13,550	17.85
25 x 53 x 66	25 x 48 x 61	24,800	20,750	16.30

\*The reason these decrease in percentage is that over 15 in. total thickness, by the previous method, the depth of the groove remained constant so the sidescrap is less in proportion to total weight.

Average slab weight since adoption of the present method is 2625 lb. Therefore, the over-all savings have been almost exactly 10 per cent.

er movable rather than try to move the heavy slabs. A four-post gantry which moves on rails, Fig. 2, was developed. It has a travel of 60 ft. The cross beams are arranged so that they may be adjusted by power transversely and perpendicularly within the frame. The gantry is moved with a railroad jack. The two beams which support the welder are set at a 6-deg, angle as required for carbon arc welding.

Slabs up to 42 in. wide, regardless of their length, are set up in troughs, which are constructed so that they also have the necessary

FIG. 4—Successive steps in starting a carbon are weld.

6-deg. angle, Fig. 3. Slabs over 42 in. are set up in reinforced concrete pits spaced between the rails at each end.

This arrangement enables slabs to be set up in either the pit or the troughs, while welding is being done elsewhere in the line. When operations were first started, it was only possible to operate 23 per cent actual welding time per turn. This proportion has now been improved to the point where operation has often been at 50 per cent of the full turn. The ultimate actual welding time expressed in percentage is probably about 60 per cent because the runs are relatively short and, there must be numerous stoppages.

#### Subsidiary Equipment

Under practical operating conditions, it is virtually impossible to expect a perfect fit-up in all cases, so that certain jigs and drawjacks are employed. Rather than try to hold the components together mechanically, some hand welding is required; therefore, it was found advisable to secure a third 400-amp. generator. Heating equipment of a simple nature has been secured to insure freedom from moisture within the assembly.

In view of the occasional fractures of the welds during rolling, it was decided to put more power through the machine. Therefore, a 600-amp. generator was secured, which is hooked with one 400-amp. machine into a fixed circuit with the welder. In addition, the second 400-amp. generator can be cut into the circuit to provide 1400 amp.

#### Cooling System Redesigned

When the amperage through the boots was increased to more than

1000 amp., the magnetic boot began to burn out in some cases and the carbon-carrying boot in other cases. It was, therefore, necessary to augment the cooling capacity of the system. The manner in which this was worked out may be observed in Fig. 5.

The water cooling system is the most critical item to be handled in automatic carbon arc welding. The current carried to the boots by four cables is then carried to the carbon by thin walled copper tubing through which water is pumped. If high current is used, it is advisable to have a separate feed and return line to each boot. There are vacuum switches in the water return lines which break the arc immediately if the water flow stops. The water system is a closed system pumping from a 42-gal. tank and returning to a 55-gal. drum. The return lines are run into an old type brass tube automobile radiator, to which a ventilator type fan

#### TABLE II

#### Analyses of Costs of Carbon Arc Welding of Clad Steel Sandwiches

(These cost figures cover 1100 assemblies, 2,885,798 lb. The average assembly was 33 x 47 x 6 in., and the average weight was 2625 lb.)

Direct Costs	
Welding carbons	\$491.12
Filler metal	796.34
Steelflux	1,807.92
Overhead	700.12
Power	559.78
Sundice	512.91
Supplies	
Maintenance	901.39
Engineering expense—misc	229.41
Labor—operating welder	8,035.03
Social Security taxes — (labor)	190,80
Workmen's compensation in-	
surance	65.32
Depreciation on equipment	1,737.99
Total direct costs	\$14,028.13
Administrative and General E	xpenses
Interest	128.28
Public liability insurance	57.50
Taxes	855.27
	2,350.00
Salaries	
Organization expense	272.20
Office expense	88.26

Cost per lb. = \$17,779.74 ÷ 2,885,798 lb. = \$.00616.

3,751.61

Total number lineal ft. welded = 29,326.

Ultimate cost per ft. = \$17,779.74  $\div$  29,326 lb. = \$.6063.

Labor cost per ft. = \$8,035.03 ÷ 29,326 = \$.2057.

ower cost per ft. = \$559.78 ÷ 29,326 = \$.0156.

was connected. This arrangement kept the water temperature below 120 deg. F. in the hottest weather.

The water switches are most important as, if they do not shut the machine down immediately when the water stops circulating at the proper speed, either boot may be ruined. These switches should be placed at the highest point in the line to eliminate any back pressure. The water lines should be made of hose which has a firm rubber lining inside and one or two plies of reinforcing, such as beer hose.

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#### **Actual Welding**

Let us now consider actual welding with the above-described equipment. A guidance chart, Table IV, has been prepared. The arc voltage, amperage, and welding speed per minute for each of the sizes has been established by actual practice, and in each case has been found to vield the strongest and most ductile weld at the rolling temperature. Not all thicknesses have been included. Where the thicknesses are different from those shown, the settings will be proportional within the ranges indicated for each of the settings.

This chart has been set up on the basis of the thicknesses of the assemblies in ascending order. This is not necessarily the predominant factor. The depth, or thickness, of the spacer bar will predetermine the character of the weld desired, but the relationship between the insert thickness and the backing thickness does not remain constant

because of variations in thickness of cladding material.

At the bottom of the chart, there is an exception in the order. This is a single bead weld. In all other cases two beads are made on each side of the assembly. (See Fig. 1.) In assemblies where the spacer bar is ½ in. wide or less, however, it has been found that one single arc weld safely may be made along the center of the spacer bar.

The recommended positioning of the carbon in the molten pool is shown in Fig. 6. This position is, of course, a function of voltage, amperage and speed. It is a practical means of verifying the correctness of the settings. When the carbon is too far behind the front of the crater, porosity develops.

For a given amperage, the penetration remains substantially constant regardless of the rate of speed. However, at a relatively high speed, the cross-sectional area of the weld is V-shaped and comparatively flat on top, raising only slightly above the plane of the two pieces being welded. If the speed is decreased below normal, the cross-sectional area of the weld is increased to a U-shape. The best weld is approximately twice as wide at the top as it is deep.

Penetration of the weld relative to amperage is given below:

Current Amp.	Penetration In.
800	1/2
900	5/8
1000	3/4
1200	13/16
1400	7/8

In this particular application, due to the presence primarily of the separating compounds, there was trouble with moisture. During welding, it was found that not only

TABLE III

Comparison of Welding Methods on a Linear Basis

Total Thickness In.	Number Welds Per Side Former Method	Number Welds Per Side Carbon Arc	Previous Cost Per Ft.*	Present Cost Per Ft.
3	1	1	\$.6063	\$0.7500
5	2	2	1.2126	1.5000
71/2-10	3	3	1.2126	2.2500
over 10	4	4	1.2126	3.0000

\*The cost figures on the previous method were not available, but from very close contact with that machine and costs from similar machines, estimates are held to be conservative.

TABLE IV
Guidance Chart\*—Carbon Arc Welding (Presuming Proper fit-up)

Total Thick- ness, In.	Backing Thick- ness, In.	Insert Thick- ness, In.	Spacer . Bar, In.	Slab Weight, Lb.	Arc Voltage	Amperage	Welding Speed Per Minute, In.	Beads Per Side	Beads Per Seam	Remarks
5	2	1/2	3/4 x 1	350- 5,000	35-37	875- 925	5-51/2	2	1	Use • filler wire generously—hold down flux
71/2	3	3/4	1 x 1½	2,000- 7,500	37-39	925- 975	41/2-5	2	1	Use filler wire generously—sufficient flux to cover arc
71/2	3 .	1/2	1 x 1	1,800- 7,000	39-41	975-1025	41/2-5	2	1	Use filler wire generously—sufficient
10	4	1	11/4 x 2	2,500-20,000	39-41	1025-1075	3-31/2	2	1	Use filler wire and flux generously — Keep arc and pool well covered
121/2	5	11/4	1½ x 2½	3,500-23,500	40-42	1050-1100	21/4-31/4	2	1	Use filler wire and flux generously— Keep arc and pool covered
18	7	2	2 x 4	8,000-25,000	41-42	1100-1150	21/2-3	2	1	Use filler wire and flux generously— Keep arc and pool covered
25	10	21/2	2 x 5	11,000-25,000	42-43	1150-1200	21/2-3	2	1	Use filler wire and flux generously— Keep arc and pool covered
3	11/4	1/4	1 x ½	up to 3,000	37-39	900-1000	41/2-5	1	1	Set arc on center of spacer bar. No too much wire but plenty of flux

Intermediate settings, etc., will be proportionate. Generally speaking, the depth of the spacer bar will be the determining factor in the settings.

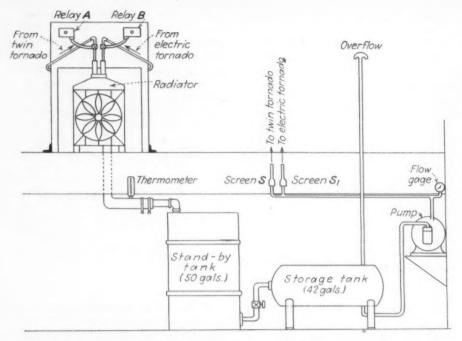


FIG. 5—Cooling system devised for cooling the magnetic boot and the carbon boot of the Electronic Tornado automatic welder when operated at high amperages.

was steam generated, which caused trouble in rolling, but the weld itself tended to be less solid. This difficulty has been overcome almost entirely by pre-heating the slabs at 120 to 130 deg. F. for approximately 24 hr.

The original practice was to hand weld starting and stopping lugs on either end of the run. It was subsequently discovered that this is not necessary if one proceeds as per Fig. 4. By setting the carbon 3/16 in. from the edge of the slab, a pool is created which does not wash down the side. As soon as a crater of the proper depth is formed, proceed at the prescribed speed. When you get to the end of the run, the machine may be halted momentarily about 3/16 in. from the end, which will likewise produce a thorough weld.

The accuracy of the fit-up of the

various components will obviously have an important bearing upon the welding procedure. Experience would indicate that a tolerance of 1/16 in. may be safely applied to any point of fitment. Fig. 7 shows six misfits. Where a gap exists as indicated at A, move the carbon over onto the backing slab about 3/16 in. from the open seam. Using relatively low amperage, low voltage and ordinary speed, make a light weld which closes up the gap without letting much molten metal fall down between the inserts, because only the cooler portion of the pool enters the gap and it freezes immediately. After the gap is closed in this fashion, go back and make a regular weld.

#### Skilled Operator Required

The skill of the operator plays an important part in closing gaps. A

gap is not necessarily of uniform width. It usually develops because of a bow in one or more of the components. If the welder is skilled, he can guide the machine so that it will maintain the 3/16 in. distance from the gap along the entire line of welding.

At B in Fig. 7 is shown what is probably the worst condition, because the effective depth of the bar is decreased. The thickness of the spacer bar is such that the arc weld will almost penetrate through its entire thickness. If the slab is not too heavy nor too large, or if the projection is not more than  $\frac{1}{8}$  in., it is best to proceed with the welds in much the usual manner except that the voltage and the amperage should be decreased so as to reduce the penetration. The poor fit-ups shown at C, D and E are all handled

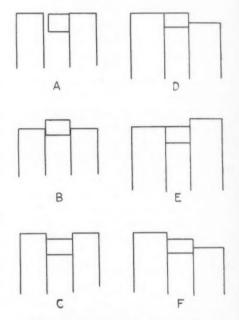
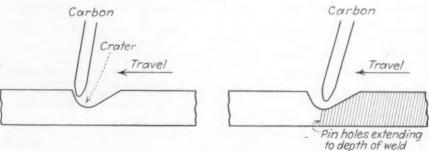


FIG. 7—Six examples of poor fit-up discussed in detail in the text.

in a similar manner, that is, the high side is welded with reduced power. In the case of F, weld the highest abutment first, following the same procedure as outlined for R.

In some instances, the welding heat may cause a slight gap on the unwelded sides, even though the components may be very well tacked together. If this gap is between 1/16 and  $\frac{1}{8}$  in. wide, it has been found that a good weld can be effected by simply increasing the potential by 2 volts. If the gap

FIG. 6—If voltage, amperage and welding speed are properly selected, the carbon should be positioned with reference to the front of the crater as shown at the left. If the carbon is positioned as shown at the right, it indicates too fast a speed. Porosity results.



exceeds  $\frac{1}{8}$  in., use the procedure as described for Fig. 7 A.

#### "Arc Blow"

Any one who has used carbon arc welding equipment has probably encountered "arc blow." In our case, it has been found that this can be corrected by increasing the forward speed of the tractor. Or the filler wire can be guided nearer to the arc magnet side of the boot, at the same time lowering it to within  $\frac{1}{8}$  in. of the slab.

Cracks occasionally occur in the welds. This condition is more apt to be encountered when using special analysis of backing steels. The higher the carbon and/or the higher the alloy content, the more the tendency will be to cracking. In such cases, the slab is welded com-

pletely all around, then re-welded after cleaning off the flux, but all filler wire is shut off, the usual speed and voltage are retained and the amperage is reduced by 50 to 75 amp. If, when re-welding is started, re-cracking is encountered, the slab is allowed to cool for 24 hr. and then the re-welding procedure outlined above is followed. If a crack does not extend the full length of the seam, weld the full length of that seam anyway. Generally speaking, when you cannot hold your hand on a slab, do not weld on it.

After the assembly comes off the arc welder, it is carefully examined for any fissures or craters. Short fissures, 2 to 3 in. long, may be hand welded. Likewise, craters may be corrected by hand welding.

In conclusion, it may be said that carbon arc welding has fulfilled expectations satisfactorily. In fact, so far as increase in yield is concerned, it has exceeded expectations. The costs per linear foot in this application probably do not compare particularly well with the usual adaptation of the process It is felt this may be explained by the fact that runs are comparatively short, though numerous; and at all times, maximum penetration on heavy sections is striven for. However, it is entirely clear that the present linear foot costs are very favorable indeed for the carbon arc welder, as compared to the previous method. The character of the weld meets requirements to a greater extent than did the previous meth-

## Pilot Light Minimizes Error in Precision Lathe Work

HE possibility of error in precision lathe work requiring an accuracy of 0.00005 in. has been minimized as the result of a pilot-light indicating method developed by M. M. Cunningham, a foreman at General Electric's Schenectady Works. The method eliminates the human element inherent in the old practice of using a magnifying glass to see when the tool makes contact with the surface to be cut.

In Cunningham's method, electrical contact between tool and work is used to close a light circuit, telling the operator exactly when to set the dial indicator at zero, and thus establishing a sure basis for making a cut within the required accuracy.

The tool is brought up to the surface to be cut in the regular manner until it is just about to make contact. From this point on it is brought up very slowly until the pilot light flickers. Very little further movement is required until the light is steady. When it is, the indicator is set at zero. A cut of any desired thickness can then be made with the accuracy of the cut dependent only on the accuracy of the indicator and its reading. If that is set and read correctly, there can be no error.

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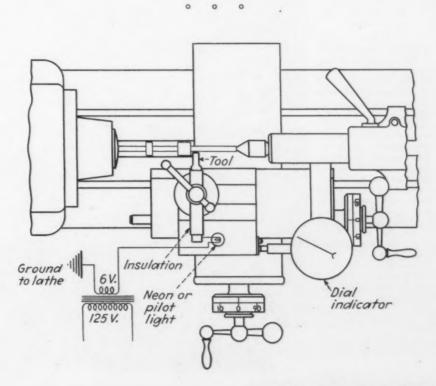
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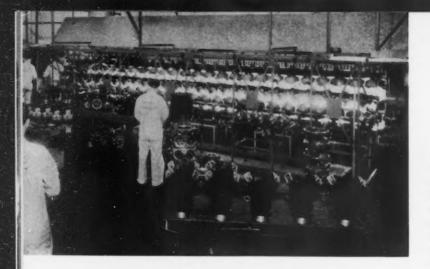
Either an incandescent or a neon indicating lamp can be used for the pilot light. A small transformer is used to reduce the standard 110-

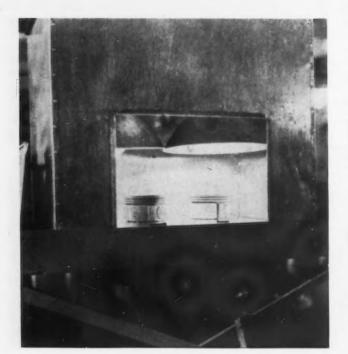
volt circuit to 6 volts for the detecting circuit. One line from the transformer is connected to the bed of the lathe, and the other line to the screw shell of the light socket. The center contact of the light socket is connected to a metal strip which makes contact with the lathe tool, being set against the tool when it is locked in the tool post. The tool is

insulated from the tool post with a piece of varnished cambric or light cardboard.

This pilot-light indicating method can also be used where the work is stationary, such as on milling machines, by insulating the work from the machine and connecting the center contact of the light socket to the work.







## Near Infra-Red

By PAUL H. KRUPP Fostoria Pressed Steel Corp.

... The infra-red process has expanded from its original field of baking finish on metal, into drying, dehydrating and preheating jobs, involving wood, rubber and textiles as well as metals. In war production, airplane motors, bombs, mine-sweeper buoys, propellers, gas masks, periscopes, insulation, shell cases, shock absorbers, and dozens of other items are all affected at some stage of production or finishing by the near infra-red process. Some of these applications are pictured here.

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#### ABOVE LEFT

THIS battery of infra-red reflectors at Jacobs Aircraft Co. dries and bakes finish on engine parts. Three composite coats of finish are applied with a 5-min. standout between cach, then all three coats are baked in approximately 5 min. Shortly after the parts are baked, they are coal enough for further assembly. Previously they were air dried overnight. With a similar use of radiant energy, Union Fork & Hoe Co. dries grinding wheel abrasives. Twelve infra-red reflectors mounted on a 24-in. diameter steel ring dry a layer of abrasives <sup>1</sup>/<sub>2</sub> in. thick on the 2-in. wheel in 30 min. Two wheels are processed in the drying zone at one time. The installation has increased production from two wheels to ten

PISTONS and rocker arm blocks at the Air Cooled Motor Corp. plant are preheated with infra-red, to insure proper fit and speed the operation. Assembled motors are dried after the steam-cleaning operation and later are spray painted and baked in the same tunnel that performed the drying operation. A new wrinkle in radiant energy preheating has been devised by the Norton Co., involving the melting of rubber binder from steel abrasive wheels to reclaim the steel. Abrasive material, vulcanized on the steel, is raised to 550 deg. F. in 5 min., at which temperature the binder softens and drops off. The wheel is suspended between two flat banks of 30 lamps each.

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THIS picture shows being dried on alclad aluminum sheets at Vultee Aircraft Division. As drying takes place in about 30 sec., it is possible to stack the sheets immediately. Among other uses to which radiant energy is put in the aircraft industry are the baking of wood parts, the drying of parts after degreasing prior to finishing, the drying of glue in wood fabrication, the drying of parts during chromium plating, the dehy-drating of dope, and drying operations manufacture of rubber sections of bullet-proof tanks.

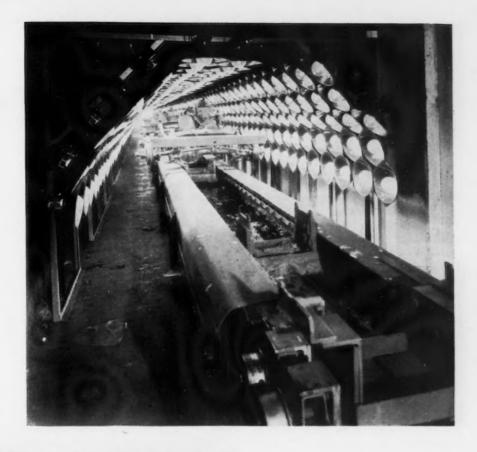


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JEEPS are baked in this tunnel at Willys-Overland Co. The tunnel was installed on the interior of a 185-ft. convection oven because of crowded conditions and because a conveyor was already in operation in the oven. No tunnel preheating is necessary, and the baking starts immediately the lamps are turned on.

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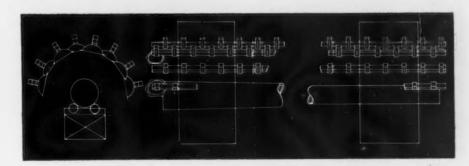
#### BELOW

PROBABLY the largest items finished by the radiant energy process are 24-ft. gun barrels. The barrels, weighing 7000 lb. each, with a breech diameter of 16 in. and a muzzle of 10 in., are placed on portable four-wheel trucks for spraying. As shown in this diagram, they are then pushed into a 261/2-ft. tunnel, still on the trucks. Each truck is equipped with motor driven revolving rollers which turn the barrel while the finish is baking. The total finish-baking time for the primer and two finish coats is 66 min.

. . .

#### ABOVE

GAS mask strap buckles get a lacquer finish baked on them in batch lots in 2 min. by infrared lamps, in comparison to 1 hr. by the air-dry method formerly used. The old method required an attendant to shake the batch lots every 15 min. to prevent sticking. Quick drying makes possible immediate packing and eliminated lacquer blushing.



## Preparation of Hardened

URING the present emergency, one of the most useful techniques for salvaging worn parts and for correcting mis-machined work is the metallizing process. Proper surface preparation by roughening is the most important step in metallizing for only with the correct type and degree of surface roughness is it possible to obtain the maximum mechanical bond strength between base metal and sprayed metal. Abrasive blasting, rough threading, or grooving and knurling in combination are used, but these processes have their limitations. Certain metals are so hard they cannot be machined even with carbide tipped tools. (For a method of shaft preparation with Carboloy tools, see THE IRON AGE, Nov. 12, 1942, p. 50.) Many hardened surfaces may be blasted only with partial success. Parts with narrow edges, flat areas with exposed ends and shafts having key-

FIG. I—Microphotograph (100X) of the edge of a steel plate prepared by the "Fuse-Bond" process. Although the electrode material is securely fused to the base metal, the penetration is slight. The irregular surface produced greatly enhances the mechanical bond with the sprayed carbon steel coating.

By W. C. REID

Vice-President, Metallizing Engineering Co., Inc., Long Island City, N. Y.

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ways or splines are other examples of parts that frequently offer difficulties in preparation or in service when standard methods are employed.

As a solution to such problems, the Metallizing Engineering Co., Inc., has developed the "Fuse-Bond" process for preparing surfaces of all types and of the hardest metals. With it any metal part, regardless of its hardness, size or shape may be given a bond equal to or better than that afforded by the most efficiently rough threaded or blasted machinable surface.

With the Fuse-Bond process, electrical resistance heating of a high nickel alloy electrode applied to the base causes the electrode metal to be simultaneously exploded into a foam and firmly fused to the base metal. This metal foam has a structure comparable to that of frozen soap suds, with a great many irregularly shaped cavities over its entire surface. Its overall contour also is very irregular. Height of these surface irregularities can be controlled, ranging approximately from 0.004 to 0.030 in.

The final result is an extremely rough and porous surface on the base metal—an ideal bond for subsequent coatings of sprayed metal, which can be obtained on practically any kind of metal surface with a single analysis of electrode material. This bond closely approaches the tensile strength of the sprayed metal itself, and is surpassed only by the bond obtained on a machinable base by grooving with a special rotary tool.

The accompanying photomicrograph, Fig. 1, shows the bond structure clearly. It will be noted that although the electrode metal is securely fused to the base metal, penetration is very slight. The depth of this penetration varies from practically nothing to a maximum of about 0.005 in. Yet, while the electrode material is deposited and fused by heating, the heat is confined to a very small area

on the surface. It is possible to keep the base metal as cool as desired, in order to avoid heat stresses and prevent changes in its grain structure.

#### The Electrical Unit

The electrical unit is shown in Fig. 2. It is a special transformer unit, with an open circuit voltage of 9 volts maximum. Among other considerations this makes for safety in handling the live electrodes and keeps down the heat. Rating is 2.5 kva. The object is not to produce an arc, although some flashing and spattering of the electrode material does occur and it is highly necessary for the operator to wear safety goggles of a deep shade.

The unit is arranged for use on 110 or 220 volt, 60-cycle, single-phase circuits and it is a simple matter to interchange the connections for these voltages. The primary cable is pro-

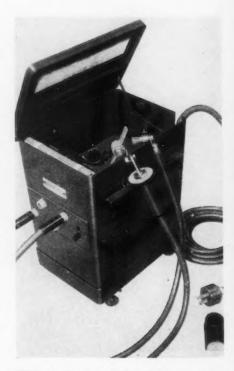


FIG. 2—The type C Fuse-Bond unit shown with primary cables and the two secondary cables, one to the electrode holder, the other to the work contact brush. Primary current is controlled by a tumbler switch on the side of the steel cabinet, next to the tap plugs.

## Surfaces for Metallizing . . .

vided with a ground conductor securely connected to the cabinet and other metal parts of the unit so as to assure maximum safety to the operator.

There are two secondary cables, each 6 ft. long. One is for connection to the electrode holder, the other to the workpiece. Where the work is to be rotated in a lathe, a copper contact brush is supplied for fastening to the lug on the end of the contact cable. The contact brush is mounted on the toolpost of the lathe, but is insulated from it so that current will not pass through the bearings of the machine

FIG. 3—With his left hand the operator grips the back ends of the electrodes and thus steadies the stroking action of his right hand.

. . . Machine components regardless of their shape or hardness can now be metallized successfully with the new "Fuse-Bond" process which creates a rough porous structure on the base metal by use of a special electrode with a transformer.

to the work. However, all metal parts of the lathe will be "alive" with respect to the electrodes.

For connection to stationary work, the lug on the contact cable is clamped directly to the workpiece, or to the holding vise.

The electrode holder is arranged to accommodate from one to six small electrodes, 1/8 in. in diameter. These electrodes are clamped between a stack of disks which act as cooling fins. Under normal operating conditions, the six electrodes are clamped parallel to each other, with their ends in line and extending about 21/4 in. from the clamp disks. In use, the operator grips the handle of the holder with his right hand and places his left hand on the protruding ends of the electrodes, Fig. 3. This gives him the proper manual control in stroking the electrodes across the work surface. The touch is light and rapid as otherwise the electrodes will tend to freeze and weld themselves solidly

#### Brushing Motion Used

By using a light brushing and rocking motion, the electrodes will contact the surface successively, rather than all at once, thus fusing one electrode at a time. As one electrode melts, and the circuit is broken, another electrode makes contact with the base. If the stroking is done as shown in Fig. 4, a surface preparation of open pattern will result. This pattern may be closed up by stroking diagonally as shown in Fig. 5. After very little experience, it is possible to control the pattern and operating technique very accurately.

As the work progresses, the electrodes tend to heat. If more than ½ in. of the electrodes is worked to red heat, the operation should be slowed up. Otherwise, there will be a tendency to deposit undesirably

large pieces of electrode metal which are not well bonded to the base.

The base metal also tends to heat up. In the majority of cases this heating will not be serious. Taps are provided for preparation of light sections so that overheating is automatically prevented. Forced cooling, such as an air blast against the underside of the work, is not objectionable, and

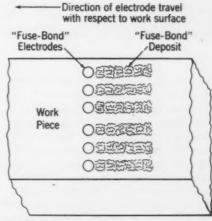


FIG. 4—Open pattern produced on the work by stroking the six electrodes in one direction.

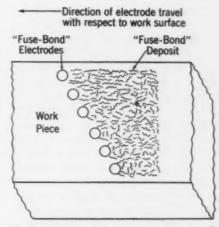


FIG. 5—Stroking the electrodes diagonally offsets the tendency to produce an open pattern or one with bare spots on the work.



FIG. 6—Preparing the ground-down surface of a crankpin journal for metallizing by use of the Fuse-Bond process. Note the diagonal angle at which the electrodes are presented to the work.

0 0

the electrodes themselves can be cooled by plunging into cold water should they heat up close to the clamp.

After the area has been prepared, loose particles, if any, can be removed from the work by brushing lightly with a clean stiff wire brush, or by running the edge of a coarse file once over the surface. Compressed air may be used to clean off loose particles, provided that it is clean and dry.

Several ranges of "heat" are provided on the unit by a series of plug connections for the two secondary leads. The accompanying table shows various textures of surface obtained with certain combinations of tap connections. At the low speed or fine texture end of the chart, the height of projections produced will be about 0.004 in. At the high speed or coarse texture end of the chart, some of the projections may be as much as 0.030 in. high. The choice of tap combinations and the resulting surface texture will depend upon the size of the work and the thickness of the coating material to be sprayed. For metallized coatings 0.060 in. thick and over, the coarse texture taps generally will be preferable. For metallized coatings 0.020 to 0.050 in. thick, the medium texture combinations are recommended. Coatings less than 0.020 in. thick call for the fine texture taps.

#### Example Cited

As an example, let us assume that a 2-in. diameter hardened shaft, a 4 in. section of which is badly worn, is to be resurfaced by spraying "Sprasteel" No. 80 (a hard, non-ma-

chinable coating wire). Also let us assume that the wear is as much as 0.020 in. deep over a large part of the area.

In such an instance, the procedure is as follows: First, grind the shaft 0.040 in. undersize on the diameter (0.020 in. undercut) through the worn section. Then chuck the shaft in a lathe. Assemble the contact brush on the lathe tool post, and bring the brush face to bear on the unworn clean section of the shaft at the right end. Cover the lathe way under the shaft with a piece of sheet metal or asbestos board to prevent marring with the "Fuse-Bond" spatter, and remove any nearby inflammable material.

A spindle speed is selected that will give a surface speed on the work of between 50 and 100 ft. per min., or from 95 to 190 r.p.m. for a 2 in. diameter piece. For medium texture, the brush cable would be plugged into outlet No. 1 and the electrode cable into outlet No. 3, according to the chart. It is preferable that the lathe be put in reverse and rotated away from the toolpost.

Application of the electrode is begun at the left of the undercut section of the shaft, first depositing a ring of bond material around the edge of the undercut. The radius at the bottom of the undercut is next prepared and then the whole undercut section is given a deposit by stroking the electrodes at an angle from right to left and toward the operator. Upon reaching the right end, the radius and corner are prepared as at the left end.

If at the end of the operation it becomes necessary to fill in some

#### Variations in Texture of Work Surface Obtainable with Fuse-Bond Unit

Speed	Texture	Tap Combination	Type of Work
LOW	Fine	1 and 2	Small work piece—small areas Hand operation with single electrode
HIGH	rine	2 and 3	Average piece—rapid hand operation or lathe operation—50-100 surface ft. per min.
	Madium	3 and 4	Average piece—hand operation or lathe operation— 25-75 surface ft. per min.
	Medium	1 and 3	Average piece—lathe operation— 50-100 surface ft. per min.
	Coores	2 and 4	Large rough work by hand. Average piece in lathe—50-100 surface ft. per min.
	Coarse	1 and 4	Average piece rough work in lathe—50-100 surface ft. per min.  Average work in lathe—75-150 surface ft. per min.

areas, the tap connections are changed to No. 4 and No. 3 respectively for hand operation. The open areas can then be spotted while the work is turned by hand.

The surface is then metallized in the usual way to about 0.010 in. thicker than the undercut is deep. Finishing is accomplished by grinding, using a silicon carbide wheel of coarse structure and soft or medium grade.

#### Coverage

For large surfaces done on either lathe or bench, averaging 2 sq. ft. or more, coverage rate with the Fuse-Bond process is 3 to 4 sq. ft. per hr. About 3 to 4 oz. of electrode material is deposited per square foot. On small pieces, much less electrode material will be used, particularly on surfaces requiring a fine texture. The coverage rate will be correspondingly less.

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In many cases, particularly on large flat surfaces where high bond strength is required only around the edge of the work, it will be found satisfactory and more economical to first grit blast all over and then apply a Fuse-Bond deposit merely on the edges. The bond obtained is satisfactory for many applications.

Where a thin coating of sprayed metal is to be eventually applied, an excellent bond may be obtained with the following procedure: The Surface is first prepared with the Fuse-Bond unit, using a high speed tap combination which affords a good surface at a rapid rate. The prepared area is then turned off with a sharp-pointed cutting tool to within 0.005 and 0.010 in, of the base metal.

For some lathe applications on mild steel and other machinable metal it has been found economical to first turn a thread on the area to be metallized, and then prepared by the Fuse-Bond process over this thread. This produces a good bond at high speed.

The new process provides an ex-

cellent method of preparing blowholes in castings prior to metallizing. To do this, the blowhole should be drilled out so that it is about half as deep as it is wide. For example, a % in. drill should be run in about 3/16 in. A single electrode is inserted in the holder, and one of the low tap combinations employed. A heavy froth of electrode metal is then deposited at the bottom of the blowhole, and a good ring deposited around the edge of the hole. The hole is then sprayed in the conventional manner.

Another outstanding advantage of the Fuse-Bond process is that its application requires no skilled labor, as do all of the methods requiring rough threading or grooving.

The Fuse-Bond equipment is not sold outright but is available to essential industries for a nominal rental and the process itself is available under a reasonable licensing arrangement. U. S. and foreign patents on both process and equipment have been applied for.

## An Ingot of Rimmed Steel Examined

HE manufacture and detailed examination of a rimmed-steel ingot are recorded in a paper by Dr. D. Binnie for the Committee on the Heterogeneity of Steel Ingots, London. The ingot selected was taken from the middle of a cast of rimming steel made by the open-hearth process. It was allowed to freeze without any addition of a stabilizer such as aluminum, or any other corrective, in order that the process of rimming could be studied in a simple form. The bath samples analyzed were killed in the sample pot with aluminum chips. An additional set of bath samples was drawn concurrently with the killed samples, but these were allowed to freeze undisturbed, that is, without any aluminum addition. These unkilled bath samples were sectioned and polished and sulphur printed.

The ingot was drilled in the standard positions, and the drillings were analyzed. Results are shown in the table below.

An analytical survey was made throughout the sectioned face of the ingot. Eleven equidistant points were marked at the bottom of the ingot from just under the skin to the center. This was repeated throughout the length of the ingot at horizontal positions six in. apart, starting with A<sub>1</sub> to A<sub>11</sub> at the bottom and ending with M<sub>1</sub> to M<sub>11</sub> at the top. Examination also included the microscopic study of the zones particularly rich in sulphur.

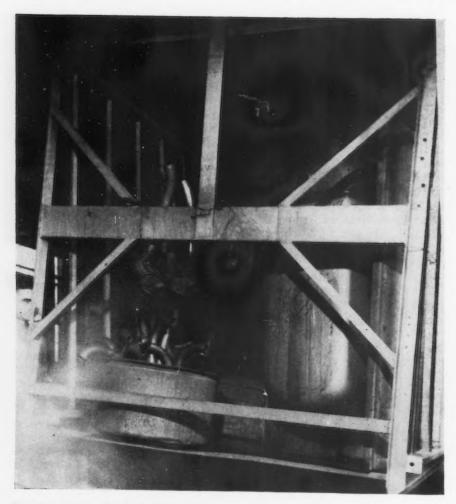
The general analysis of the core of the ingot showed a loss in carbon from the pit figure of 0.08 per cent. Also, in the lower half of the ingot, the carbon in the core

was rather less than that in the rim. The highest carbon percentage, 0.07 to 0.076 per cent, was found to lie along the axis at the upper portion of the core, and even this figure did not exceed the pit carbon figure. The carbon in the rim was, as is usually found, higher in the lower portion of the ingot than in the upper region.

In the survey of rimmed-steel ingots published by the Committee on the Heterogeneity of Steel Ingots, it was shown that the general analysis of the carbon in the core may be lower or higher than the recorded pit carbon content. An explanation of this phenomenon is derived from the balancedcomposition hypothesis of Hultgren and Phragmén, which has been developed mathematically to include the influence of manganese and pressure on the carbon and oxygen values of the balanced composition and shows that with increasing manganese content as well as with increasing pressure, the carbon content of the balanced composition is progressively increased. Hultgren and Phragmén fixed the carbon content of the balanced composition at about 0.06 per cent.

	The state of the s			The state of the s	
Position	Carbon, Per Cent	Silicon, Per Cent	Sulphur, Per Cent	Phosphorus, Per Cent	Manganese, Per Cent
A	0.040	0.009	0.032	0.011	0.27
В	0.035	0.009	0.039	0.013	0.26
C	0.030	0.005	0.050	0.014	0.26
D	0.040	0.005	0.063	0.022	0.27
E	0.070	0.009	0.238	0.055	0.29
F	0.040	0.009	0.054	0.019	0.28
G	0.050	0.005	0.071	0.025	. 0.26
H	0.060	0.009	0.148	0.031	0.29





66-THE IRON AGE, February 18, 1943

## Porcelain Enameling of Aircraft Exhausts

THE rust proofing of aircraft exhaust manifold systems and mufflers made of SAE 1025 steel has been a problem because of the cracks which develop in these parts due to a combination of the high stress concentrations which normally accompany the welding of these steels, and continued vibration of off-center loads at elevated temperatures. Thus rust proofing must either relieve stresses, or must permit rewelding of cracks, a requirement which eliminated bakedon enamel or metallizing.

The Taylorcraft Aviation Corp., maker of the L-2B Army liaison plane, has recently solved this problem with porcelain enamel coatings. The heat used in firing the coating helps in stress-relieving the welded joints, and the coating holds the heat long enough to re-anneal the exhaust unit after each running of the motor. The units are now in quantity production, with no failures to date.

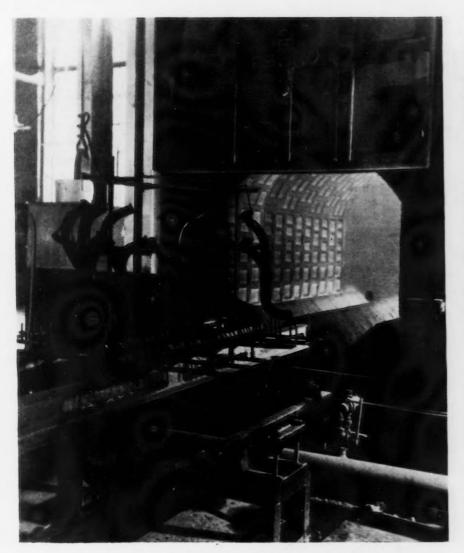
The exhaust stacks and mufflers to be treated are first put through a pickling process, then dipped in heatresisting enamel, passed through a drying oven and thence to the firing furnace. Firing at 1600 deg. F. fuses the enamel into the pores of the metal. Temperatures in actual operation of the airplane seldom reach 1200 deg. F. The same procedure of drying and firing is repeated after a second coat of enamel is sprayed on. The resulting weight increase is about one lb. for each motor.

#### UPPER LEFT

EXHAUST stack being constructed. Assembly is made of five different sections of tubing and two flanges, which must be fitted perfectly in the jig. Stress concentration at or near welds is built up by shrinkage of the material in welding.

#### LEFT

E XHAUST stacks and mufflers, in company with a bathtub, emerge from a tank of boiling pickling solution.





ABOVE A BATCH of exhaust stacks is rolled into a gas-fired furnace.

f g

ABOVE RIGHT

BOTH inside and outside surfaces are covered with ground coat of enamel.

RIGHT

THE enameled muffler assembly, with aluminum carburetor-cabin heater muff applied, is ready for installation. Continental engines are shown in the background.



## Plastic Punches Form Aircraft Sheet Metal

. . . A new thermo-plastic—tough, elastic, possessing great impact strength—gives more consistent forming of sheet metal parts and more rapid production from drop hammers and hydraulic presses.

The plastic is recoverable.

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ORE consistent forming of sheet metal parts and more rapid production of such parts in the drop hammer or hydraulic press can now be accomplished through the use of a plastic punch. Tough, elastic, possessing great impact strength, this new thermoplastic is 100 per cent reclaimable without sacrifice of physical properties.

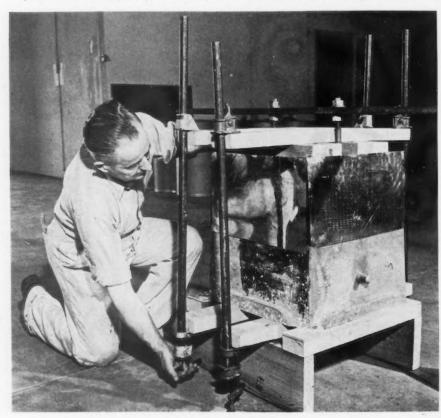
Early in 1942 the Vega Aircraft Corp., like many industries was faced with the necessity of conserving critical metals. In an effort to find a desirable substitute for lead and Kirksite punches,\* a plastic product of the Plastalloy Co. of Burbank Cal., was utilized. First trials were very promising, hence many further tests followed, formulations being constantly altered to meet the high impact required for such metal forming. Progress has been slow but decidedly encouraging. While some of the problems have not been entirely overcome, the method has reached such a degree of workability that results are here

metal thickness of the part. Thus, the die must be set up in the hammer and the vertical surfaces scraped in to the die to allow for metal thickness. The drop hammer is obviously out of production during the operation. Further, it is often necessary to re-scrape the punch after a number of parts

have been formed because the soft lead punch tends to flatten and spread. Small radii on the punch are likewise beaten back, resulting in larger radii than obtained originally, so that rubber strips must be so placed in the die as to form the metal down to the small radii. Since this condition most frequently arises when as few as 10 parts have been formed, production on the lot is appreciably slowed. An alternative is to run the whole lot through and then rehit the parts during a second run, using rubber. Either method involves a loss of time which is avoided when a plastic punch is used.

The plastic punch, like lead, is cast

C LAMPING operation to control shrink. The material is made to shrink from the top of the punch down as it cools, by means of standard cabinetmaker's clamps which apply pressure to a wood plate placed on top of the punch after first covering with metal.



\* For detailed data on use of Kirksite, also specific information on drop hammer and press technique for aircraft metals, see The Iron Age, issues of May 28, June 4, 11 and 18, Aug. 27 and Oct. 1, 1942.

presented to the industry. It is hoped that others may profit by the research—and mistakes—that have been made.

A brief review of steps necessary in making and using a lead drop hammer punch will serve as a basis for judging the advantages of the plastic punch. Lead is cast to the Kirks'te die without allowing for



S PECIAL full-scraper, spiral type agitator keeps the plastic thoroughly mixed and prevents burning during the six hours it is being mixed preparatory to being poured into the Kirksite die.

directly to the die, without clearance for metal thickness. Beyond this point, the simplicity and economy of the plastic punch method becomes apparent:

(1) The punch and die are set up in the drop hammer.

(2) Parts are then run.

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It is unnecessary to scrape the punch into the die. Being elastic, it simply springs back to accommodate metal thickness of the part, recoil accounting for its excellent forming characteristics. The same qualities account for consistent forming of small radii, beads and the like. It is unnecessary to use rubber strips to form beads. The useful life of a plastic punch has proved many times that of lead. In general, the plastic punch seems to possess the same characteristics as rubber under pressure and, when used in the drop hammer, combine the forming advantages of impact. It most consistently forms the part true to the die.

Other savings in production time and expense are illustrated by the following typical example of a lead and a plastic punch used at Vega.

#### KIRKSITE DIE WITH LEAD

- (1) Hit approximately 100 parts one time
- (2) Anneal
- (3) Pour new punch
- (4) Rehit 10 parts
- (5) Rehit 90 parts using rubber strips to force out radii. (From three to six rehits may be required to produce a satisfactory part.)
- (6) Finished

#### KIRKSITE DIE WITH PLASTIC PUNCH

- (1) One fairly good blow to set
- (2) Three blows in rapid succession
- (3) Finished

It is seen that by using a plastic punch an annealing operation and a rehit operation have been avoided. Foundry as well as drop hammer time is saved since it is unnecessary to pour a second punch.

It should be understood that plastic punches, in their present stage of development, cannot be used on all types of jobs, but those parts which are most adapted to this method of forming may be determined readily. It has been found, for instance, that plastic punches, due to their rubberlike nature, do not iron out wrinkles as readily as lead or Kirksite. But, due to their close fit, fewer wrinkles occur in the first place. This type of punch is less successful, in many cases, in forming stainless steel parts. Often the same part, in aluminum, would form well.

Certain precautions are necessary when setting up the punch in the hammer in order to avoid subsequent cracking of the punch. Threaded inserts located in the punch should line up with holes in the head of the hammer. Otherwise when the stud bolts which are screwed into the inserts are forced into the hammer, strains are set up in the plastic which are considerably multiplied by impact of the punch in use. Hole locations in the Vega hammers are not uniformly located, but this difficulty has been overcome by using % in. studs in the 1 1/16 in. holes. One-inch studs are normally used in lead punches. Nuts used on these studs must be firmly tight only, not cinched up with tremendous pressure as when using a lead punch. Since most breakage of punches has been found traceable to cracks developing at the metal inserts, these precautions alone have served to reduce such troubles to a minimum. Results are more successful, also, if Plastalloy is warm (around 75 deg. to 100 deg. F.) when set up in the drop hammer. They should be observed even though the Plastalloy Co. has now developed a material that the drop hammers, in most instances, have not been able

#### Hydraulic Press Punches

Success in the drop hammer field led to the development of Plastalloy punches for use in the double action hydraulic press. The long hours of tedious grinding required to fit the punch to the die and allow for metal thickness are avoided because, here again, the plastic punch is poured directly to the die. A limited amount of clearing of sides or shoulders is sometimes found necessary in order



#### ABOVE

AFTER cooking for 6 hr., the hot plastic is poured through a sheet metal lip of the cooking device directly to the Kirksite die with which it is to be used in the forming of sheet metal airplane parts on the drop hammer or double action press. The plastic is poured through the funnel to avoid lapping of the material, and air bubbles.

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to secure better bottoming as, for example, when beads are to be formed in the bottom of a part. However, if this must be done it can be accomplished while the punch is in the press. In the case of the Kirksite punch and die they are pulled and later set up again for another trial. Thus the plastic punch saves press set up time. Generally speaking, the punch is merely poured directly to the die and set up in the press ready to go. Due to its elastic nature the punch forms the part true to the die. Normal production difficulties are obviously encountered, but they are solved as any manufacturing problem. For example, it was found difficult to form a number of parallel beads located in the bottom of a certain Vega part. Good beads were obtained by merely increasing pressure. In fact, it was found that enough pressure could be applied to tear the part around the bottom beads.

The following is a comparison of the two methods of making punches:

#### KIRKSITE PUNCH

- Make templates
- Make plaster pattern Cast punch in sand, using mold taken from plaster

- (4) Grind in punch to fit die, less metal thickness (time: 5 days)
- Run parts
- (7) Hit on drop hammer (8) Rout (trim)

#### PLASTIC PUNCH

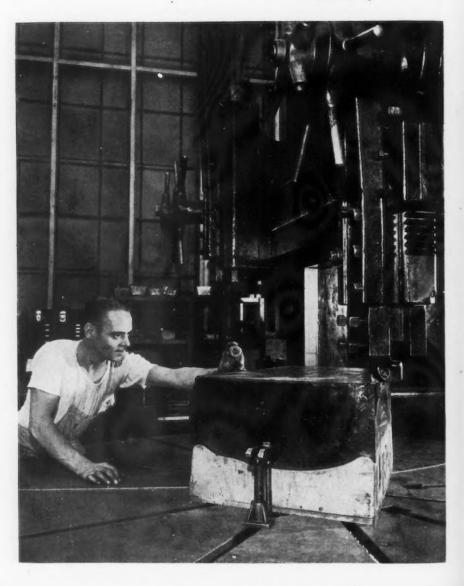
- (1) Pour directly to die (2) Clear for metal thickness where necessary (time: 31/2 hr.)

#### Casting Plastic Punches

Ordinary wood sides are built up around the die and the inside wood surfaces are lined with tin. Fillets are made with molder's clay. Sides usually extend about 10 in. above top of die, resulting in a thicker punch than is usual in lead. Experience has shown that impact is better absorbed

#### BELOW

STEEL tape is used to measure height of plastic drop hammer punch after milling.





and transmitted when the plastic punch is about 25 per cent greater in thickness than would be a lead nunch

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Two distinct Plastalloy materials are supplied and combined to form the final casting compound for punches. This is done to facilitate melting or preparation for casting. For convenience, these materials are termed Plastalloy "A" and Plastalloy "B." The former has a low melting point, while that of Plastalloy "B" is considerably higher. Plastalloy "A" is first melted to start a batch. When it has reached a liquid state, Plastalloy "B" is slowly added. The mixture is agitated from the start, and constantly during the "cook" to prevent its burning. Reclaimed pieces may be added while the mixture is being melted. As mentioned earlier in this article, Plastalloy is 100 per cent reclaimable. Used or broken punches may be broken up into chunks and remelted as indicated above. To attempt to remelt chunks directly often results in burning them before they have reached a state of fusion, hence remelt material should be added to a batch of new liquid.

The mixture is heated to and maintained about 45 min. at a temperature of 205 deg. C. (401 deg. F.), at which time the heating agent is cut off and the mix allowed to cool to 175 deg. C. (347 deg. F.), being agitated continuously.

While at this temperature the melt is cast into the Kirksite die, being poured through a special funnel (tin or similar material), the lower end

PART formed on double action press with plastic punch.

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WINDOW frame formed with plastic punch on drop hammer.

of which is kept below the surface of Plastalloy in the die. Lapping of the material, which tends to cause weakened planes, and trapping of air is so avoided. Immediately after the punch is poured, the inserts, located by means of studs to a spider. are lowered into the punch to a predetermined depth. The top of the insert preferably should not lie more than 1 in. below the surface of the finished punch. Precautions that will insure normal and properly located inserts are: (1) Level die; (2) spider parallel to die; (3) accurate spider; (4) holes for studs through spider to offer sliding fit yet hold studs close to 90 deg. Attention given these details will, in a large measure, reduce possibility of breaking punch in use.

The material is made to shrink from the top of the punch down as it cools. This is done by means of standard cabinetmaker's clamps which apply pressure to a wood plate placed on top of the punch after first covering with metal. The material is thereby prevented from shrinking away from the die and is forced into perfect conformity with it.

Cooling requires considerable time depending upon the size of the casting, so that the total time required to prepare, case, and cool a plastic



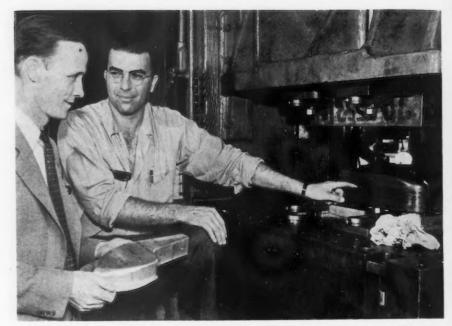
THE IRON AGE, February 18, 1943-71

punch is more than that required for one of lead. However, when operations permit having a pot of Plastalloy continuously ready to cast, as is done with lead, the over-all time will be reduced about one-half, for it requires around 6 hr. to cook up a batch.

The top surface of the cooled punch is not ordinarily smooth nor parallel to the base of the die. Therefore the punch is left in place in the die, after forms and clamps have been removed, and is surfaced parallel to the base of the die. This is done on a planer or similar machine although the operation might as easily be done by a simple set up using a hand router.

Plastalloy may be cut or worked with any kind of cutting tool. It is not abrasive and does not dull tools. Being a thermoplastic, it cannot be ground or sanded, and tends to gum up tools that generate heat rapidly, such as circular and band saws. However, it may be drilled, tapped, planed, or worked with hand woodworking tools. Further, Plastalloy is easy to handle for it weighs but 68 lb. per cu. ft.

Under proper conditions and within



FLAP-TRACK fairing formed with plastic punch on punch press. More than 1000 parts have been formed with this punch.

certain bounds of application Plastalloy produces better and more uniform parts, and does it faster than other materials. It is believed that its possibilities have not yet been thoroughly developed. Experiments are now under way at Vega which—if successful—will make it possible to cast a die from a plaster pattern and cast a Plastalloy punch into this die ready to put into work on a press, all with no machining.

#### New Standard Simplifies Ordering and Matching Colors

NEW color standard which is expected to eliminate much of the existing confusion in matching colors was explained and demonstrated at a recent conference under the auspices of the American Standards Association. The request for approval of the standard was sponsored jointly by the General Electric Co. and the Interchemical Corp. The objective of the new American war standard, Specification and Description of Color, is to reduce to a common language the results of years of technical developments in the measurement of color.

The new standard provides a language by which color may be described by means of three basic elements—either by using the physicist's "dominant wave length," "brightness," and "purity"—or by using the psychologist's "hue," "value," and "chroma." And the standard makes it possible to translate from one system to the other at will.

This standard should find extensive use in industry where equipment is built by one manufacturer to be integrated with another manufacturer's equipment. There have been many instances where the equipment would have to be refinished so that the color variance would not be noticeable. With a standard specification to meet, all parts will be of uniform color when assembled.

The new standard recognizes the spectrophotometer as the basic instrument for the standardization of color, and the use of material standards for the popular identification of color. The spectrophotometer analyzes the color in terms of the percentage of light reflected or transmitted by the color.

Relative to the use of material standards, the new standard states that the only system of material standards that has been calibrated in terms of the basic specification is represented by the 1929 edition of the Munsell Book of Color, which contains a readily comprehensible system of color samples. The use of this book is recommended wherever applicable to the specification of the color of surfaces. Approximate identification of Munsell hue, value and chroma may be obtained by direct visual comparison with the samples in this Book of Color.

The approved standard thus provides two standards: A fundamental or primary standard, in terms of which any system of color samples can be calibrated; and a secondary or working standard consisting of a series of color samples that have already been calibrated in terms of the fundamental standard.

In some cases a color name rather than a number is needed to identify a color. This can be done by using the ISCC-NBS system which is based on the Munsell system. It gives 300 of the more common color names, selected and defined by means of ranges of the Munsell hue, value, and chroma. The plan of this system was developed by the Inter-Society Color Council, an organization centered around 13 national societies interested in color. The details of the system were worked out at the National Bureau of Standards. The names are simple color names like light green, deep red, and dark brown. To each of such names is assigned, not one single color, but a considerable range of color which accords with its accepted meaning.

### Universal Drill Fixture Saves Day Per Week

ROM 24 to 32 hours per week are being saved in the drilling of marine gear casings at one of General Electric's major works by the use of this universal indexing trunnion fixture. It permits positioning the casings for drilling at any angle in a full circle and at any plane. About 110 holes must be drilled, tapped, or spot-faced in each of the casings, which vary in weight from 1000 to 2000 lb.

Before the trunnion fixture was developed, each piece of work had to be set up at least six times under the radial drill. Now, work is set up just once on a table which can be turned completely around either a vertical or a horizontal axis. The table is mounted on a U-shaped frame suspended on two horizontal trunnions. One of the trunnions is chain driven through a worm-gear arrangement by a 34-hp. geared motor. A circular indexing plate with 18 holes around its periphery is mounted on the driving side for quick selection of any of the various angles specified. A stud is used to lock the fixture.

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For lateral rotation about a vertical axis, the table must be in the flat position with the work right side up. The clamping bolts at the four corners of the table are removed, and, by turning a lever underneath the fixture, the operator raises the revolving table just enough to clear the frame. The table can then be turned and relocked in any position. The trunnion fixture may then be indexed to bring one of two side faces of the work into the drilling position. When inverted, the table also serves as a drill jig for the base of the casing, eliminating the need for

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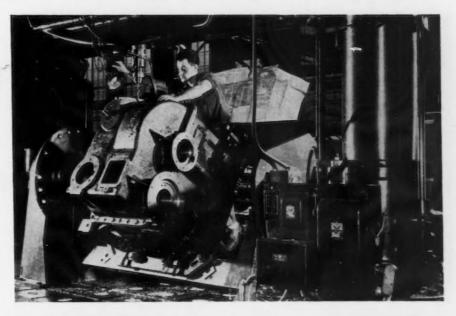
(Top)—Operator drilling a marine gear casing tilted at a 45-deg, angle in a special double rotational fixture.

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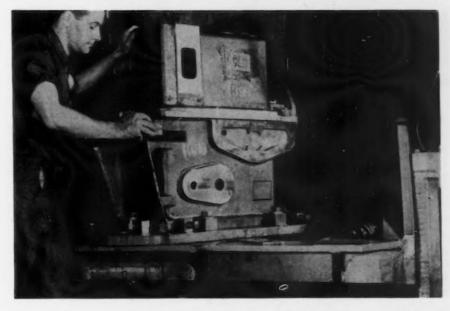
(Middle)—Fixture in the upside-down position with the base serving as a jig plate.

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(Lower)—Operator turning casing by hand about a vertical axis. It can be locked at any point of a full circle. The trunnion fixture is then rotated to bring the face to be drilled in a horizontal plane.







## New Equipment . . .

### Lighting and Safety Apparatus

New developments in fluorescent lighting fixtures, floodlights and personnel safety equipment are described herein.

E Washington Boulevard, St. Louis, has announced a new line of porcelain enamel industrial fluorescent Luminaires. The new fixtures are in two types: The XLO Flu-O-Flector, a closed end type, and the Victory XLO (illustrated) an open end type. These fixtures are designed to provide economical illumination, symmetrical light distribution and properly shielded lamps. The high lighting efficiency of these fixtures is said to be due to superwhite porcelain enamel reflectors, which are performed with a "V" design to eliminate pocketing of



light. Three coats of enamel are used. The new lights also feature new "bump-proof" socket plates to protect lampholders from breakage in transit, installation or cleaning. Starters are conveniently set in the side of the channel. These Luminaires are available for two or three 40-watt lamps and two 100-watt lamps and may be mounted individually or in continuous runs with flush-ceiling or suspended mountings.

#### Fluorescent Lighting Fixture

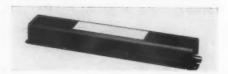
A NEW development in fluorescent lighting is claimed to provide illumination to full intensity without flicker or delay the in-



stant the switch is turned on. In this new unit, named Insta-Lite, offered by the *Spero Electric Corp.*, 18220 Lanken Avenue, Cleveland, ballast and starting switch functions are combined and no additional starters are required. Made for two 40-watt tubes, for 110-125 volt a. c., Insta-Lite is offered in fixtures for industrial and commercial installation.

#### Ballast for Fluorescent Lighting

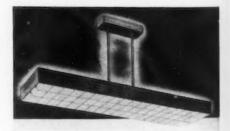
THE development of a 4-lamp ballast for fluorescent light of war plants has been announced by the General Electric Co. The new ballast will operate four 100-watt lamps. This new ballast requires 48 per cent less copper, 47 per cent



less iron and steel and 50 per cent less aluminum. It operates over a line voltage range of 250-280 volts, and is applicable to circuits in the 265-/460 volt Y-class.

#### Fluorescent Drafting Room Unit

THE Wakefield Admiral is a new wooden fluorescent lighting unit for office and drafting room offered by the Wakefield Brass Co., Vermillion, Ohio. Ninety per cent of the total light output is cast down on the working surface, the remainder goes to the ceiling to avoid harsh contrast. The Admiral is standard in two, three, four and six-lamp units and may be secured for continuous runs. The reflector is a Masonite reflector board and



there is a V shaped deflector between each pair of lamps. Highly efficient reflecting surfaces are provided by two coats of infra-red baked white synthetic enamel over one coat of primer.

#### Fluorescent Lights

EDWIN F. GUTH CO., St. Louis, have announced the development of a line of industrial fluores-



cent lighting fixtures in which the reflector is formed of pressed wood in an effort to conserve on steel use. This new light-weight reflector is said to readily take Guth's 300 deg. white finish, enabling war plants to continue to get "indoor daylight." This new Maze-Lite for two or three 40-watt and two 100watt lamps features steel housing, side-of-channel starter switches for easy trouble shooting and bumpproof end plates for protecting the lamps during transit, installation and servicing. Unit or continuous mounting is possible without use of angles or extra parts.

#### Fluorescent Lamp Ballasts

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As additions to their line of single and two-lamp ballasts, the Jefferson Electric Co., Bellwood, Ill., announces two new ballasts—No. 234-983 for operating three 40-watt fluorescent lamps, and No. 234-982 for operating four 100-watt lamps. The new four-lamp ballast is designed for operation on



line voltages ranging from 250 to 280 volts and is applicable to circuits in the 265/460 volt Y class. These multiple lamp ballasts greatly reduce the amount of critical materials required, save installation time and reduce power consumption.

#### Fluorescent Lights

F LUORESCENT lighting fixtures employing a new method of ballasting to give positive, instantaneous starting have been introduced by R. & W. Wiley, Inc., 777 Hertel Avenue, Buffalo. With this method, the lamps come on fully at the turn of the switch. The conventional starting device is eliminated. Other features of the new method are positive starting at lower atmospheric temperatures and lower voltage, no radio interference and satisfactory tube life.

#### Composition Reflectors

O conserve critical steel, Sylvania Electric Products, Inc., (formerly Hygrade Sylvania Corp.), Ipswich, Mass., announces eight new industrial fluorescent fixtures with composition reflectors. Fixtures range in size from 100 to 300 watts and are available for either individual or continuous-row mounting. The reflectors are finished in Mira-coat baked white enamel, and the outside of the units is French gray. They come complete with Sylvania fluorescent lamps and Mirastat starters, ready to install and operate.

#### Fluorescent Lamp

HYGRADE SYLVANIA CORP., Salem, Mass., has announced the availability of a new fluorescent lamp specifically designed for low temperature operation. Hygrade's new low temperature (LT) lamp is designed to start and operate satisfactorily at temperatures as low as 0 deg. F, when used in conjunction with Hygrade's Mirastat No. 4.

#### Surface Wiring Device

LINE of Moncor surface wir-A ing devices for use in wiring cantonments, warehouses, temporary industrial buildings, war housing, etc., has been announced by the wiring device section of the General Electric Co., Bridgeport, Conn. These plastic devices can be endconnected or side-connected for surface wiring and back-connected for concealed wiring. The line includes a duplex convenience outlet, a single pole "T" rated switch, a keyless lampholder, a pull chain lampholder and a junction box and rosette. Knockouts in the devices can be removed with a screw driver.

#### Fluorescent Lighting Unit

A NEW lighting unit, designed to furnish high intensity lighting for industrial inspection areas and to produce illumination for high bay areas, has been announced by the Edwin F. Guth Co., 2603 Washington Ave., St. Louis. This new unit conforms with WPB order L-78 and features the use of a non-metallic reflector. It is called the Super-Maze-Lite and features bump-proof ends to protect lamp

holders against abuse and to insure correct distance between lamps. The reflector has a deep light cutoff and is formed of masonite reflector board. It is available with the new Forlamp ballast for 265 volts and also for 110-125 and 220-250 volt circuits in eithor the 4-40 watt or 4-100 watt fluorescent lamps. When used for high bay lighting, 4-100 watt size delivers more lumens than does a 400 watt H-1 mercury lamp or a 750 incandescent lamp lighting unit, it is claimed.

#### Panel Mounting Indicator Light

ITTELFUSE INC., 4757 Ravenswood Avenue, Chicago, are manufacturers of an indicator light which instantly reports a break in the circuit. When installed in connection with remote motor control, it works instantly with a plainly visible signal to show "on" or "off." When the circuit breaker opens, the light goes on. It can be had for 24 or 48 volt filament bulb, with which no resistor is used. Otherwise it uses a built-in 200,000-ohm protective resistor in series with a neon lamp. The resistor prevents the lamp from blowing out on unexpected high voltages. In the Littelfuse installation the lamp glows on currents as low as 100 micro-amp. The indicator has a black bakelite body and transparent molded cap. The rating is 90 to 250 volts.

#### Portable Floodlights

O the standard Circulite floodlight line, Steber Mfg. Co., 2451 North Sacramento Avenue, Chicago, has added new large models for floodlighting shipyards, shipways, loading and unloading areas, railroad yards, factory grounds, as well as providing emergency lighting. They may be placed anywhere, mounted on floor, or directly on truck or other vehicle. Models supplied with casters are particularly useful in assembly and repair shops. This 1610 series Circulite employs a 300 to 500 watt lamp, is adjustable to any angle vertical or horizontal, has a 2 in. chromium plated reflector and is supplied with extra long cord for portability.

(Continued on next page)



Floodlight

YOMMERCIAL METAL PROD-UCTS CO., 2255 W. St. Paul Avenue, Chicago, announces a complete line of floodlights ready for installation, made of one-piece formed steel. They are provided with heat resisting lenses insulated to prevent smoke, dust or rain from penetrating the interior. Compco's new mounting method assures unlimited adjustment and each floodlight is given a hard, baked-on "plastic enamel" surface inside and outside. The floodlights are available in all sizes from 200 to 1500watt units.

#### Floodlight

A NEW floodlight featuring a unique combination of socket housing and reflector die formed in one piece had been announced by the lighting division of the General Electric Co., Schenectady, N. Y. Made entirely of steel, the floodlight utilizes a 200-watt bulb and provides a wide beam which can be pointed in any desired direction by means of the two-jointed shaft upon which the unit rests. The floodlight, known as the type L-66, was designed to provide an inexpensive means of outdoor illumination.



ance; twin-cartridge type respirator used for protection against light concentrations of organic vapors and acid gases, whether occurring separately or in combinations.

#### Safety Hats

A NEW series of safety hats, created especially for women in industry, has been announced by B. F. McDonald Co., 1248 So. Hope Street, Los Angeles. There are four designs and all models are ventilated to make them cool, even when worn constantly. No sizes are required since each model is adjustable to fit any head. The hats are made of plastic mesh and transparent plastics. Models include a cap with broad visor, a turban of mesh and a transparent plastic one-piece crown and visor.

#### Finger Guard

Pollowing the introduction of the individual finger guard, the Industrial Gloves Co., Danville, Ill., announces the incorporation of this protector for thumb and first two fingers into a single unit. This new guard is designed for punch press work, buffing, grinding, sorting, assembly, inspection, etc., where protection is needed only on thumb and first two fingers.

#### Hand Cream

RECOMMENDED for both men and women is the new Breck hand cream manufactured by John H. Breck, Inc., Springfield, Mass., for the protection of hands against grime. The cream, which is described as being neither acid nor alkaline, provides a coating to the skin which absorbs the dirt instead of the skin doing so. It washes off easily with only the usual soap and water.

#### Pump Tank Fire Extinguisher

A NEW pump tank for use on incendiary bomb fires has been introduced by the American-La-France-Foamite Corp., Elmira. N. Y. This tank produces a straight stream and not a spray. The tank is made in 5 gal. and 2½ gal. sizes. Stream has a range of 30 to 40 ft. and is equipped with a standard 26 in. hose. An oversized air chamber assures minimum pulsation and a more constant stream. The unit is self-contained and can be readily transported up ladders, over roofs and to points difficult of access.

#### SAFETY APPARATUS

#### Light-Weight Respirator

THE Willson No. 10 respirator, offered by Willson Products, Inc., 264 Thorn Street, Reading, Pa., is one of the lightest weight respirators ever to receive Bureau of Mines approval. It is practical



tour of the wearer's face, and is particularly adaptable for use by women.

Filter Cartridge

THE new Mersorb filter cartridge, recently introduced by Mine Safety Appliances Co. for use with any of the company's standard cartridge respirators, provides protection for 70 hr. against light con-

centrations of metallic mercury va-

pors. The chemical cartridge respi-

rator, for which the Mersorb car-

tridge is designed, is a low resist-

for long periods of time without

impairing workers' efficiency. Un-

usual breathing freedom is provid-

ed through specially designed in-

halation and exhalation valves.

Elastic headbands are lasting and

hold the respirator in place. Face piece is adjustable to fit the con-

76-THE IRON AGE, February 18, 1943

# DID I DO THAT?

SMITHWAY WELDING MONITOR **Trains Welders Better and** 1/3 Faster; Saves Critical Material

Even a student welder is amazed at how quickly he learns to make difficult welds with the SMITHway Welding Monitor. Actual case histories prove that it not only trains welders better in one-third less time but also reduces the electrode poundage required for training from about sixty pounds to forty pounds per student a 3313% saving in critical war material.

Developed by A. O. Smith to meet our own needs in our own plants where thousands of tons of welded products are made each month, the SMITHway Welding Monitor is a device which automatically tells the student and the instructor when the electrode is being fed at correct speed, and when feeding speed is not correct. It is simple, easy to operate, inexpensive to buy, and pays for itself many times over in timesaving and in improved quality of welds. It will enable you to train more operators with fewer instructors - and quickly replace men taken by

#### HELPS INSTRUCTOR

The Smith Welding Monitor enables the instructor to handle larger numbers of students. The Monitor is placed so that its

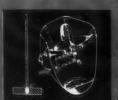


lights are visible from a distance. They signal correct and incorrect welding as do the lights in the welder's shield. The instructor gives his attention where it is most needed.

#### MEETS REQUIREMENTS OF ALL TYPES OF ELECTRODES

Requirements of all of the various welding electrodes available today are met by the Smith Welding Monitor. Its dials are calibrated and the pointer merely has to be set on the value that has been found to be best for the particular electrode being used.

#### **HOW IT SIGNALS OPERATOR**



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#### **SMITH Certified** WELDING ELECTRODES

- made BY welders -FOR welders

The Smith line includes (1) Mild Steel Electrodes, (2) High Tensile Electrodes, and (3) Stainless Steel Electrodes. Smith Laboratory Control positively assures uniformity between any box of electrodes purchased today and subsequent shipments of the same type.

#### SMITH A. C. ARC WELDER

A precision-built machine for precision welding, ruggedly constructed to carry heavy loads continuously without injury . . . 20% to 25% greater deposits than obtained with D.C. .. . no arc blow . . . light weight ... compact ... mobile ... high efficiency ... high power factor.

#### PRICE - \$150 Net F.O.B. MILWAUKEE, WIS.

This price includes Welding Monitor; plug connections and cable bulbs; also lighting assembly for mounting in your own helmet or hand shield.



#### MAIL COUPON FOR CONVENIENCE

A. O. Smith Corporation
Milwaukee, Wisconsin
Please send us complete information about:
() Smith Welding Monitor; () Smith Certified Welding Electrodes; () Smith A. C. Arc Welder.

Company Name .....

Address

City.....State.....

Individual



MILWAUKEE . WISCONSIN . HOUSTON . TEXAS

# Assembly Line

 McNutt 48-hour week stirs questionings and problems ... UAW local charges bottleneck at Martin Nebraska plant . . . Dealers' group rejects Nugent plan for sales . . . Army truck locks in limbo.



ETROIT - The 48-hr, week order of WMC chairman Paul V. McNutt may prove to be a far-sighted piece of executive thinking. For the time being, so far as Detroit is concerned (and Detroit is considered one of the "tight" labor centers) it may serve to do little more than increase the cost of the war.

The automotive industry today is working an average week of approximately 47 hr. Skilled men, those most in demand, are almost universally working well above 48 hr. Unskilled men, the ones whose hours will be stepped up, are still available in today's labor market in most centers, bolstered by estimated immigration into Detroit of some 20,000 workers monthly. Women who have signified willingness and capability to take on war work represent at least 50,000

Some question can be raised, too, as to how many men will be released as work schedules are increased. Most war plants which are not up to capacity today, whether by reason of temporary cutbacks or materials problems or schedules not yet at peak, are definitely interested in husbanding their supply of men. Labor hoarding would be no surprise in such plants.

The brunt of the 48-hr. blow, then, will likely fall on non-essential industry whose production prospects are constantly diminishing as the war goes on. Perhaps this is the intent of the McNutt order. For these plants, regardless of their desire to retain their labor force, are inevitably caught between fixed prices for their

products and cost increases engendered by requisite overtime hours.

At lowest, costs in a company hitherto working 40 hr. will rise 8.3 per cent by installation of 48-hr. shifts, even after payrolls are trimmed in proportion to the increased work. At highest, with all employees retained. the increase in costs would be 30 per cent. Some smaller companies, lacking substantial capital structures may find this a mortal blow.

It is obvious that the upshot of the order for the present, so far as the war program goes, is to increase the amount of payrolls and increase the costs of war materiel.

Where schedules are below 48 hr. today, the causes are lack of materials or slow schedules for shipments of finished goods, rarely scarcity of manpower. Ordnance schedules have been and are continuing to be reduced, and military vehicle output has not been at capacity for many months. Most Navy schedules in automotive plants are limited by materials availability. Aircraft engine schedules are limited not only by materials but by the increasingly apparent fact that engine production is outstripping the capacity of the airplane manufacturers to absorb it. And the airplane schedules themselves are being held back by the

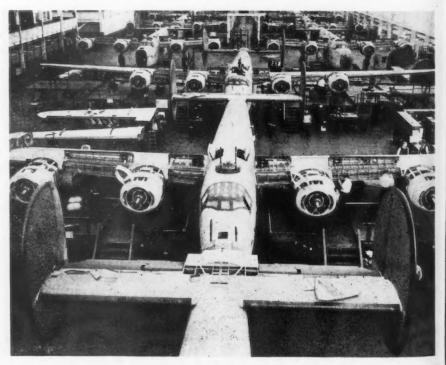
narrow supply of aluminum, particularly in forgings and extrusionsshapes which are limited by plant capacity, not manpower.

BYPASSING of contracts which forbid plant layoffs until schedules have been reduced to 32 or 36 hr. is not expected to provide a major problem, even though it might seem to be an imponderable obstacle in the way of making men available by lengthening work-weeks. Although the UAW has not said so publicly, it is understood that it will agree to waive such clauses in its contracts.

By taking the manpower bull by the horns now, toreador McNutt may stick oncoming manpower shortages in the neck. That result remains to be seen, but so far as Detroit is concerned there is increasing doubt over the dependability of figures gathered on forthcoming labor requirements.

One fact of these projections is that all factories have reported their anticipated maximum requirements, but these will not fall at the same time. Some aircraft plants, like Willow Run, will not reach peak until late this year. Other arms plants are at capacity today. Ordnance cutbacks of the sort which have been so common

PRODUCTION LINES AT WILLOW RUN: Planes moving on twin production lines (background) at the Ford Willow Run bomber plant come to a single assembly line where the outer wings of the B-24 Liberator bombers are added (foreground). Then the big ships move along the conveyor line to the point of final completion.



"PUT IT ON THE BLANCHARD"

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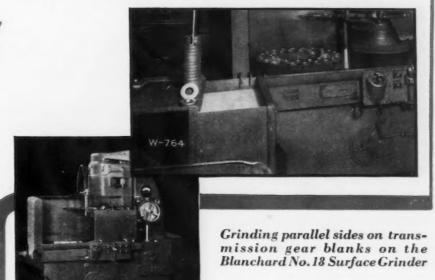
Material Saving

Fine Finish

- \* Flatness
- Close Limits



valuable on jobs like the one illustrated.



THE transmission gear blanks, shown above, are ground on a Blanchard No. 18 Surface Grinder. They are held on the 30" Blanchard magnetic chuck. The blanks are  $3\frac{1}{2}$  inches in diameter and are made of forged alloy steel. .020 inches of stock is removed from each side to limits of .0005" for parallelism. Blanchard Grinding produces accurate blanks that stack and cut well—and produces them at a rate of 250 (500 surfaces) per hour.

The BLANCHARD
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64 STATE STREET, CAMBRIDGE, MASS.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.



in the past few months point to the possibility that a number of plants' peaks may lie behind them, so far as can now be seen.

It should be added that many plants could get along with a considerably smaller number of employees than they now have without increasing hours and without resorting to speedups. Length of the work week is not as important as the amount of work put into it. It is no uncommon sight to go through a plant today and see employees sitting in pits beneath production lines, or off to one side, reading magazines or comic books. Such plants simply have too many men for the work being done, and a comic book is a logical means of passing the time of the superfluous employees. Lengthening of the work week will not change the habit of reading comic books while war jobs go forward a few feet away, nor will this habit be changed until plants are freed of the tentacles which organized labor has succeeded in placing to hold men onto jobs.

Bearing on the 48-hr. week order. and on general problems of production, is the situation brought into the light late last week by the DeSoto bomber plant local of the UAW. This local charged in a letter to a Detroit newspaper that production in its plant is being held down due to inability of the Glenn L. Martin Co. to absorb output in its Nebraska assembly plant.

Work being done at the DeSoto bomber plant is on sections for B-26 bombers. It has been said in Detroit that the delays at the Nebraska plant have been such as to cause output curtailments not only at the DeSoto plant, but at the Hudson plant in Detroit and the Goodyear plant at Akron, both of which are also producing B-26 components.

The union letter stated that gross pay of most of the DeSoto bomber employees runs \$44.80, which would indicate around 40 hr. of work a week.

Army Air Force officials had no comment on the charges, but admitted they had been visited by a union group on the matter. They pointed out that since Nebraska lies in another procurement district they had no direct contact with the situation.

Stories heard in Detroit on the matter were that difficulty in obtaining sufficient skilled supervision at the midwestern Martin plant lay at the root of the slow start on final assemblies at that point. As a result of delays in final assembly, substantial stocks of finished sections have piled up at Detroit, and work reductions have ensued. In addition, the shipment delays have spread over a period in which a number of changes were made in the B-26, leading to the likelihood that many of the completed sections may have to be reworked to make them usable at this date.

O go the production problems. Auo tomobile sales departments have their worries also today. Typical is the attention which they are giving to the progress of the Rolfe Nugent plan, which would touch off the sale

#### 10,000th Trainer Plane Turned Out by Plant

• • • More than 10,000 planes have been built in the trainer series by North American Aviation, Inc., at its plant in Dallas, it has been announced by J. H. Kindelberger, president. It was Kindelberger, president. It was pointed out that the total of "more than 10,000 airplanes" includes both complete planes and equivalent airplanes produced as spare parts.

of post-war automobiles, refrigerators and other consumer goods by payments now and deliveries after the

The automobile manufacturers have never relished the idea but have staved in the background as it was discussed, feeling that it was more properly a problem for the dealers to pass on. The dealers have now done so. A formal statement of policy by the National Automobile Dealers Association opposes the program.

Dealers have two evident feelings. One is that they may incur ill-will among their customers by selling goods sight unseen which the customers may not ultimately want to have. This feeling may be accentuated by the fact that sensationalized articles have led the public to expect much more than the quasi-1942 models which they will obtain immediately after the war. The other factor is that selling of cars now may simply eliminate markets after the war.

Too, there is the likelihood that dealers will find themselves in the middle on deliveries, by facing the end of the war with big order banks. It is a certainty that automobile production will not be able to begin at once. Reconversion must be accomplished in the automobile plants. The factor of materials will be tempo-

For an exclusive roundup of the steel industry's opinions on the 48-hr. week order as interpreted in key centers, see bages 110-111.

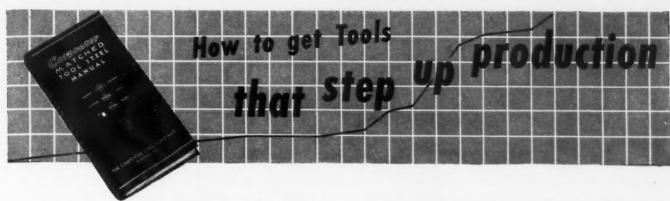
rarily present, as much then as today, with all civilian goods makers scrambling for the then-available supply of steel and other metals, and the automobile manufacturers also seeking largest possible shares of the thenexisting tire stocks. Were the war to end anytime in the coming 18 months, synthetic rubber production would not be at sufficient levels to meet demand, and natural crude might not be available in finished tire form for as much as eight or ten months, due to war disruption of natural handling and transport systems.

The NADA stand on the Nugent plan, therefore, brought silent hosannas from the automobile company front offices. The hosannas were intermixed with equally silent frowns, however, at the action of some automobile dealer associations which are seeking to freeze dealer franchises.

These associations are compaigning for legislation or agreements which would restore all franchises at the end of the war to any dealer who wants his back. This might not be unwelcome to one or two car companies which are fairly well satisfied with their dealer organizations. But this is not typical; and it is particularly true that practically every sales manager in the business is laying plans to sign up every available dealer as soon as the war ends. Franchise freezing would be unwelcome news to the starters in what promises to be a wild and woolly race for outlets.

UTLOOKS are mixed on the dealer situation as it stands today. Atlantic coast dealerships were dealt a hard blow by the no-pleasuredriving ban; their service volume, on which they are dependent for existence, sagged sharply. As a result, some automobile sales managers expect a higher mortality this year than last. But others feel that last year winnowed out the bulk of the weaklings, that 1943 will find the shutdowns greatly diminished.

For the moment the eastern dealers are fattening despite the service work drop-off. The prohibition on pleasure driving brought a heavy volume of used cars onto the market, at sacrifice prices. Car wholesalers who ordinarily do their big business in Detroit and other midwestern centers moved east and began to pick up large stocks for shipment to western arms centers where there is good car demand. The eastern dealers are profiting by this business bulge; the wholesalers are doing very well; and the western and southwestern outlets are also turning a nice penny on the situation.



When the problem of selecting the steel for a new tool comes up—when the heat treating procedure for best results must be decided upon—that's where "The Carpenter Matched Tool Steel Manual" can help you in many ways to

get the kind of tools that give *plus* production. Because it is so handy to use, so packed with information, so *practical*, it is the "bible" of many tool engineers—used over and over to help solve problems of tool steel selection and use.

How to choose the <u>Right Steel</u> for Each Tool

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For instance, picking the recommended steel for every type of tool is simplified with the 80-page Tool Steel Selector Section that is included in the Manual. Just flip the pages and it quickly indicates the one to use—and tells you why.

How to

Heat Treat
it properly

Another section of the Manual gives complete and accurate heat treating instructions for each of the Carpenter Matched Tool Steels—in a concise and readily usable form that your tool room will appreciate. It eliminates guesswork, helps you get tools that can step up production. Use this worthwhile information to help your all-out war effort.



#### How to Quickly Identify Tool Steels

For quickly checking the identity of the tool steel before heat treating tools—wer identifying mixed stock and segregating scrap—here is a wall chart (21" x 30") that can help you train your men in spark testing. It clearly identifies the spark of each of the Carpenter Matched Tool Steels—and provides information on spark characteristics caused by the major alloys.

We will be glad to send you the "Carpenter Matched Tool Steel Manual" and the "Guide for Spark Testing Tool Steels" free. Simply write us on your company letterhead.



The Carpenter Steel Company, 121 Bern Street, Reading, Pa.

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IMPORTANT BEFORE... VITAL NOW



# Washington . . .

• Rise of raw material prices may start steel advance... Labor demands threaten Little Steel Formula and stir concern over price control... Experience elsewhere shows increases inevitable.



ASHINGTON—The OPA steel Division is sitting on steel prices. High steel division officials who in February, 1941, turned down the arguments of ore producers for higher prices with the statement, "We will not take any action which will have the effect of making necessary a price rise for steel products," are of the same opinion still.

This attitude sticks despite rises in the cost of living, the advent of the "little steel" formula raising by 15 per cent the wages of hundreds of thousands of workers, freight increases allowed by ICC, increased costs of raw materials and stringent taxation. While the prices of many steel products fortunately, are much below what they stood at in World War I, cost factors which make up steel prices are several hundred per cent higher—notably taxes.

OPA's argument against any substantial increases is, of course, apparently defensible. OPA says the cree of steel price increase will be matched in costs to the government. It is OPA's belief that increased costs are inflationary and steel price increases would be reflected in the cost to the government of nearly every

munitions contract.

The price policy being followed by OPA with respect to steel is to permit individual adjustments wherever abnormal hardship is worked by price levels. Some marginal pig iron producers can expect exceptions in price ceilings if they can justify them. This



Press Association

WITNESS HOOVER AND SENATORS: At the capitol to testify before a senate sub-committee considering the advisability of limiting appropriations to hold down the size of the Army and Navy, Herbert Hoover visits briefly with Sen. John H. Bankhead (left) and Sen. Arthur Vandenberg (center).

means that the companies will have to submit profit statements for OPA review showing every element entering into cost. However, recent price rises permitted by OPA on coking coal and coke point toward some general adjustment. While some prices may be allowed to rise slightly, the chances are best for as level a price structure as possible.

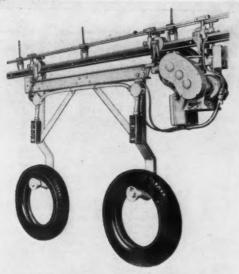
NDEED, there are unconfirmed but persistent reports that rail prices may be boosted while the prices of certain alloys will be decreased. The Truman report may have the effect of reducing the prices on the leaner alloy steels which the committee said would conserve alloying elements. The Truman report said:

"It is natural for steel consumers to purchase the cheapest articles that will meet their requirements. In too many instances the lowest prices prevail on the steels that are least desirable to the overall steel program. The National Emergency steels for instance, have been developed to serve as adequate substitutes for steels rich in alloying elements. But the new

steels are now more expensive. As a result steel consumers purchase and use, and have been allowed to purchase and use, the standard steels instead of the satisfactory new alloysaving steels."

HERETICAL as it might seem, and no matter what OPA wants, general increases in steel prices are inevitable if the American experiment in price control goes the way of European controls. OPA Administrator Prentiss Brown showed his understanding of this when he said at his first press conference that there would be a controlled upward creep of prices.

Incidentally, this statement provoked the criticism of OWI Chief Elmer Davis, whose thought apparently was that public frankness about economic principles is not the wisest course. It is reported that Leon Henderson was careful at all times to refrain from discussing this delicate subject because of the fear he had of public and industrial reaction to economic truth. It was thought that the public confidence in price con-



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## BETTER

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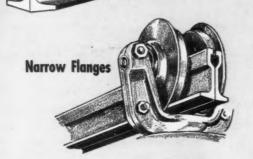
NOW, when the need is great, you can better your production of war material with American MonoRail equipment in many processes where handling impedes your war effort.

Later, after Victory, you will have essential equipment available for changes in product or process. American MonoRail, because of its extreme flexibility, offers such versatile application without costly adjustment or lengthy engineering. American MonoRail standard parts fit quickly into complete systems to solve a wide variety of handling prob-

lems. Prepare now for changes thenequip now for speed up toward Victory!! Let our engineers show you results obtained in hundreds of successful installations.







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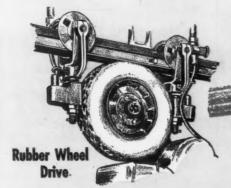
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THE AMERICAN MONORAIL CO. 13103 Athens Avenue

THE IRON AGE, February 18, 1943-83

In the book "The War Against Inflation" by Erik Kjellstrom, G. H. Gluck, Per Jacobsson and Ivan Wright, copyrighted in 1942 by the trustees of Rutgers College, the Swedish, Canadian, British and Swiss price control results are described. In Sweden which established controls in 1939, the index of steel prices rose from 126 to 135. Machine prices rose from an index of 140 to 151 in the period from August, 1939, to November, 1941, while the general index of industrial production dropped from 126 to 104. The latter was caused by price decreases in forest products (export), pulp and paper, food, textile and other industrial consumer goods.

HE authors note upward price drifts in each country. Mr. Kjellstrom who wrote the Swedish section of the book summed up:

"Price control does not imply stablestationary prices. It means control over the movements of prices."

Even in this country, since price controls were instituted, prices have risen. From May, 1942, to August of last year the cost of living index recorded a rise of 1.3 per cent. Since August the rise has been slow but steady, although steel index increases have not been made available by OPA. Such increases would have to depend upon the individual adjustments, exceptions rather than average prices. Price exemptions would have to be added to average prices with their relative importance weighted to determine the percentage of rise on this basis.

If it were conceded that a slight but orderly price increase in steel is inescapable it would only be fair to compensate for labor's new demands. The "little steel" formula is under attack by John L. Lewis's UMW. Covertly the attack has the support of AFL and CIO. Betting is that Byrnes' promise to hold the formula won't last over 90 days with the result that another barrage of new purchasing power will assault the dam against inflation.

On the other hand, if prices were allowed to zoom as they did before price control was put into effect in the last war it would destroy all efforts to control prices and that would mean disaster.

#### Cited for Award

• • • The following plants have recently been selected by the War and Navy Departments, to receive the Army-Navy "E" award for outstanding performance on war work.

E. B. Badger & Sons Co., West Virginia Ordnance Works, Point Pleasant, W. and Poirier &

Cauldwell-Wingate Co. and Poirier & McLane Corp., Orangeburg, N. Y. E. I. du Pont de Nemours & Co., Inc., Chickasaw Ordnance Works, Milling. I. du Pon Chickasaw

Chickasaw Ordnance Works, Millington, Tenn.

E. I. du Pont de Nemours & Co., Inc., Wabash River Ordnance Works, Newport, Ind.

Hunkin-Conkey Construction Co., Cleveland Aircraft Assembly Plant, Cliff Park Village, Ohio.

J. A. Jones Construction Co., Hoffman, N. C.

N. C. N. C. N. Staten Island, N. Y. Manhattan Construction Co. and S. E. Evans Construction Co., Camp Chaffee,

Evans Construction Co., Camp Chaffee, Ark.
Merck & Co., Inc., Falls of Schuylkill Plant, Philadelphia.
Merck & Co., Inc., Stonewall Plant, Elkton, Va.
F. H. McGraw & Co., and Freeto Construction Co., Jayhawk Ordnance Works, Baxter Springs, Kan.
Frederick Snare Corp., Intransit Depot, Port Newark, N. J.
Federal Shipbuilding & Dry Dock Co., Kearny, N. J. (renewal)
Selta Mfg. Co., Milwaukee.
Continental Rubber Works, Erie, Pa.
Acme Pattern & Tool Co., Inc., Dayton, Ohio.
Portland Forge & Foundry Co., Portland, Ind.

Buffalo Pumps, Inc., Buffalo. Hussman-Ligonier Co., St. Louis.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



#### Porter Named Chairman WLB Shipbuilding Commission

• • • Paul R. Porter. Chairman of the WPB Shipbuilding Stabilization Committee, has been elected chairman of the National War Labor Board's Shipbuilding Commission by the unanimous vote of the commission it was announced Feb. 15 by WLB. The commission, which has been given authority over all labor disputes and all voluntary wage and salary adjustment cases in the shipbuilding industry, is preparing to hear its first case in the near future.

#### Kaiser Gets East Coast Contract for Liberty Ships

• • • In less than two weeks Henry J. Kaiser, shipbuilder, will be operating his first east coast shipvard.

The Maritime Commission has transferred to the Kaiser Co., which already builds about one-third of all Liberty ships, contracts to build 32 more at the Providence, R. I., shipbuilding yard of the Rheem Mfg. Co. "to expedite the delivery of ships required in 1943 to meet the 18,890,000ton building program."

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PAGES 150-153

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# WEST COAST ...

• Steel production at big Utah plant postponed until late fall... Kaiser furnace in only partial operation... Other plant lag...Consolidated Aircraft head predicts increased use of steel in large aircraft.



San Francisco—Admission by Irving S. Olds, chairman of the board of U. S. Steel, that the big integrated steel plant which the Steel Corporation subsidiary, Columbia Steel Co., is building near Provo, Utah, will not be completed until the autumn leaves are red brings into the open for the first time the full extent of delay which is facing some parts of the far western industrial facilities expansion program.

When the starter's gun was fired, the Provo plant, known as the Geneva Works, was slated to run a neck-andneck race with the Kaiser plant at Fontana on which would be the first into production. Delays haunted construction schedules at both plants. It soon became apparent that the Kaiser plant would not produce pig iron by Dec. 1, as so airily predicted, and the plant built by Columbia gradually began to lag behind the schedule calling for completion by early 1943. The degree of lag became more pronounced at Provo, due principally to the huge size of the undertaking, which will rank among the country's first five steel making units. The Kaiser Fontana plant is considerably smaller, but has received more publicity, partly because of its colorful sponsor, partly because it is producing pig iron on the West Coast, for the first time.

Difficulties in carrying on construction in an isolated area have been pronounced in the case of the Utah plant, but a major portion of the delay is traceable to equipment manufacturing concerns in the thickly populated West, and no small part of the blame is traceable to another thickly populated center of the Potomac.

The Provo plant is being built by Columbia as agents for the Defense Plant Corp., but it is reported that no operating contract yet has been signed, although Columbia is regarded as in line for the job.

The barefoot boys of the steel industry quite freely acknowledge that the way was stormy in building the Fontana plant, too. Likewise, much of the trouble has occurred in securing delivery of necessary equipment, particularly in such critical items as motors, and special materials required for such units as the coke by-products plant. Faith was kept with the public by holding blowing-in ceremonies prior to the first of the year, at which thousands were gratified by an instantaneous flash of flame, but pig iron tonnage so far reputedly has not reached rated capacity. Necessity of

LOOKING INTO THE BREECH:
This gunner on a U. S. battleship
looks through the breech block of
one of the big 16-in. guns. His left
elbow rests on the "mushroom" of
the gun which he keeps clean with
the towel wrapped around his arm.

Harris and Ewing



importing coke from distant producing centers, caused by delays in securing continuous operation of the plant ovens, have further contributed to already high costs. It is still a matter of conjecture when raw, let alone finished, steel will be produced.

AN ambitious program for expanding Coast steel foundry capacity, mostly with DPC and Navy funds, has proved equally hardy. Failure of eastern electric furnace manufacturers to approach original delivery schedules, together with a complete breakdown in securing other electrical equipment on time, has been the principal cause of delay.

Dramatic proof that supervision of plant expansion by the armed services is no panacea is furnished by two northern California steel foundries. Navy gold braid has not succeeded in hewing its big General Metals Corp. foundry closer to the timetable than has Defense Plant Corp. on a \$22,000,000 job built by Columbia Steel.

As a matter of fact, of all the units in the far western steel expansion program which were originally scheduled to be close to or in production by this time, only two have actually contributed to appreciable finished steel production. These are additional open hearths built at two Coast plants of Bethlehem Steel Co., both of which additions were at one time casualties of stop-construction orders. Recovering from these prenatal set-backs, this new raw steel capacity was brought to completion and into operation without benefit of fanfare except in the "Help Wanted" advertisements.

Increase in the production of finished steel at the two Bethlehem plants is thus made possible because these plants previously had excess finishing facilities in relation to raw steel capacity. These production facilities were built originally by an independent Pacific Coast steel producer, and absorbed by Bethlehem somewhat over a decade ago. Prior to the present emergency, no justification existed for enlarging the facilities into better balance.

EXTENSION to the Coast of the WPB program for concentration of reinforcing bar production in rerolling mills has brought relatively little change to the production pattern. In normal times, reinforcing steel is the bread and butter of the

The Horse that
Unlocked

a Treasure

The first adventurous inhabitant of southern Europe who climbed upon the back of a horse and managed to stay there long enough . . . experienced a new sensation of speed and power. The horse—the first to lend his muscles to man's service—gave man the key to a treasure so vast that it has not yet been counted.

Power—the ability to get work done by some means outside himself that is infinitely stronger—has made man civilized . . . enabled him to annihilate distance and literally move mountains. If we read fossil records correctly, natural horse-power was the first step toward the engines of iron and steel that serve us today.

But, like the horse, these iron and steel engines must be bridled and controlled. The prime movers which man has created have a common failing: They cannot deliver full power until they reach a certain speed. That's why it has been necessary to devise some means for a moving engine to pick up a standing load—and this is the business of Twin Disc Clutch Company.

Because this company specializes in the development and manufacture of these power links, we provide not only the most advanced engineering, but economy of production as well. Our engineers are ready to work with you now in planning the application of special or standard Twin Disc clutches, hydraulic couplings or hydraulic torque converters, to your equipment as you will be building it, when America is once more at peace. Twin Disc Clutch Company, 1402 Racine Street, Racine, Wis.

Accurate, responsive control of extremely heavy loads is a "must" in drilling oil wells. Twin Disc Hydraulic Torque Converters\* (Lysholm-Smith type) are overwhelmingly successful in this work.

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Coast mills. Because Coast re-rolling facilities are practically nil, and because many government specifications and sizes now in demand do not permit filling of orders with re-rolled rail bars it will be manifestly impossible to realign producers and products greatly. Release of official announcement that the Coast would be brought into the program placing complete dependency for reinforcing steel on a single plant may have been due to lack of understanding of the Coast production picture in Washington, D. C.

I NCREASED markets for steel in the aircraft industry became a sounder bet than ever last week when Woodhead went on to take a poke at "arm chair experts who will tell you that the stuff we're flying now can be made over easily into commercial transports." He conceded that there might be some conversion after the war but said "it will be strictly a compromise measure—a stop-gap, or fill-in operation.

"Our military planes are built for high performance and specific missions. Fuselages are small, allowing them to carry just enough crew, armament and bombs to get there, do the job, and return as quickly as possible. For example, a fuselage 10 ft. in diameter can carry a bomb load of 20 tons. It would have to be of much which the \$64 question for everybody is "What's going to become of the aircraft industry after the war?" And like everyone else who has played the game, Woodhead had no pat answer. He said that the industry would enter a period of fierce post war competition, that it would never revert back to old job shop methods. (Ed: Some say that the industry has never completely abandoned them.)

"We would like to contemplate building aircraft in lots of 500 rather than in lots of 50 because we could do it more economically at less cost per unit to the purchaser," Woodhead timidly ventured. "I can assure you that we can use the conveyor line to make lots of 50 more economically than we could make them if we went back to the outmoded prewar methods."

The Woodhead speech, incidentally, rubbed salt into the partially healed soreness existing between certain sectors of the aircraft industry and Henry J. Kaiser over mass production of cargo planes. Woodhead mentioned, in passing, that Kaiser had declared over seven months ago that he could be in mass production of giant cargo planes within six months, and wondered where the planes were. He recalled other Kaiser estimates made during the heat of battle last summer that 50-ton planes could be built in ten months and 200-ton planes in 14 months.

The haymaker failed to catch the mass production shipbuilder off guard, however. Kaiser declared that his estimates had been based on mass production, and parried that he had received no mass production orders for such planes.

"God knows, I'd like a mass production order, though," he mused.

Speedy setting of a date for a NLRB election to determine whether employees of the Douglas Aircraft Co.'s El Segundo, Cal., plant will be represented by the CIO, AFL, or neither, appeared certain. Donald Douglas, company president, last week asked the board to hold the election as soon as possible, and thus avoid prolonged board hearings.

#### Radio Materials Aided

• • • The preference rating of broadcasting stations requesting materials for maintenance, repair or operating supplies has been raised from A-1-j to AA-2X under Order P-133 as amended last Thursday by WPB.

FOR THE FIGHTING FRENCH: Late model Gnome Rhone engines found undamaged outside a hanger at a North African airfield when U. S. forces took over the base. They will be used by the Fighting French Air Force.

British Combine from U. S. Army Signal Corps.



Harry Woodhead, president of Consolidated Aircraft, told the San Diego chapter of the S. A. E. "it is my personal belief that steel will be used more and more as aircraft increases in size and weight." Coming from the country's biggest manufacturer of cargo transport and bombing planes, the remark carried more than ordinary weight. It possibly may be attributed to missionary work on the part of T. M. Girdler, whose background with Republic Steel has already left a heavy imprint on the aircraft industry.

greater diameter to carry 20 tons of passengers or normal cargo.

"Although the gap between military and commercial types is widening, we will use the principles developed in war and adapt them to our commercial designs. Also, when the war is over we will be able to standardize our designs to a greater degree and use them for several years. This will result in considerable economy, which we could pass on to the purchasers."

Even Consolidated's head man could not resist indulging in the favorite California industrial quiz, in

# HELP in solving the "MANPOWER" problem

Whatever increases the productivity of the manpower which industry now has reduces the problem of obtaining more manpower.

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Vickers Hydromotive Controls increase the effectiveness of manpower. Each man or woman can produce more on a Vickers-equipped machine. Less training is required, accidents and spoilage are reduced.

Completely automatic cycles are easily set up so that the operator need only load and start the machine. Overload protection is positive and automatic. Controls can be so interlocked that neither the work nor the machine can be damaged by inexperienced or careless operators. Controls easily can be concentrated in one position for simpler, more rapid operation. A fingertouch operates them. As a result the operator is not subjected to nervous or muscular fatigue.

All of these factors tend to obtain more production from existing manpower. Discuss your specific machine requirements with a Vickers Application Engineer.

VICKERS Incorporated 1420 OAKMAN BLVD. . DETROIT, MICH.

APPLICATION ENGINEERING OFFICES: CHICAGO CLEVELAND DETROIT LOS ANGELES NEWARK WORCESTER

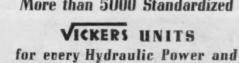


VICKERS YDROMOTIVE CONTROLS



CONSTANT DELIVERY













CONTROL ASSEMBLIES

# Fatigue Cracks

Such A Thorough Gentleman

• • • If you are visited by a suave, well-dressed, be-spectacled gentleman (50-55, 150-160, graying hair) who suggests that this is a good time to subscribe for your favorite family journal from two to five years in advance, that will probably be A. Moore, a highly suc-

cessful subscription impostor.

If he offers a receipt bearing the name of the Publishers' Service Bureau, then your caller is certainly A. Moore. Moore, whose real name is said to be A. Yerden. formerly used a fake receipt form bearing the names of 22 business papers, of which we were one. Now he has a new receipt, which narrows the field down to two, us and our contemporary, American Machinist. It looks like this:



The old receipt gave the address of the fictitious Publishers' Service Bureau as 428 Fifth Ave., New York. Apparently, non-existence grew dull at 428, so the Bureau is now enjoying non-existence farther up-

town, at 847 Fifth Ave.

We have never met Mr. Moore, but his victims in northern Ohio, western New York State, and southern Michigan say he is very gentlemanly. He will lose his temper only if you say, "Send us a bill and we will mail a check to the publisher." He likes cash, but will accept a check made payable to the imaginary bureau.

When last heard from he was operating in Detroit. Lieut. Krug and Sergeant Burke of the Special Investigation Squad, Detroit Police Department, are eager to meet him. If he calls on you and you are in the Detroit area will you telephone them. Otherwise, will you please wire us, collect.

Airplane Solvent

• • • If the non - existent Publishers' Service Bureau wants to branch out into new fields, we have a suggestion to offer. It might become the Eastern sales agency for a concern we saw listed in a directory as a manufacturer of anti-aircraft.

... And Long Remember

Regarding your Feb. 4 article, "Glass Gages Spon-sored by Ordnance Department," does anybody want to bet that Lt. Col. Stone introduced glass gages into

ordnance work?

My Bannerman catalogue is home in the attic, but memory says they used to offer, as curios, a set of big semi-circular, O.D. fixed gages which had been used in a U. S. arsenal for making cannon during the Civil War; and that these gages were "made of crystal in order to avoid the effect of heat expansion."

Of course, I could be wrong.

If you want to get technical you might find that the Phoenicians, who seem to have invented everything from the alphabet to knock-rummy, used a crude form of glass gage for sizing spear heads.

**Verdict From Headquarters** 

I notice you are snarled up over the pronunciation of "bauxite." There seem to be two schools of pronunciation around here: (a) the "box-ite" or down-to-earth school, which vastly outnumbers the (b) "bawks-ite" or old-school-tie-Latin school.

We once ran upon (c) the "boze-ite" or upper-Park-Avenue school. consisting of one benighted soul, but soon convinced him that he, and his dictionary, were

wrong, after which we let him up off the floor, picked up his glasses for him, and even helped him quench his nose-bleed at the water fountain. He was an announcer hired to dub in the voice on one of our sound movies, and was very proud of being able to say "boze-ite"

and was very proud of being able to say boze-tre without anybody telling him.

As I recall, Barney Hobbs used up only two or three lengths of rubber hose to convince him that we were probably very fussy, but we liked "box-ite," and would even settle for "bawks-ite," but we certainly were not going to pay our hard-earned money to get "boze-ite."

-Herndon A. Oliver, Jr. Aluminum Co. of America

The word "bauxite" is derived from Chateau de Baux, in France. That would make it "boe." So boze-ite it is. I lost a bet of 50c finding that out.

The Aluminum Co. of America is certainly entitled to cast the majority vote, so we will say box-ite hereafter. Besides, it is a big advertiser. M. I. L. should ask for his money back.

Make 'Em Short and Simple

• • Oscar T. (Globe-Union, Inc.) Roder kicks about our use of fancy words. We don't like them eitherthey slow up reading. The other day we were reading a murder story in the Satevepost and ran across subrisive. It completely took our mind off the story. People who write murder stories shouldn't even know words like that.

Of course, we have to use them occasionally to save space, as paper is rationed. Take, for instance, the word aptronym-a trick word all right, but it takes the place of "name-that-sounds-like-the-job." L. W. Howard, of the Peerless Electrical Products Co., Los Angeles, writes that one of the partners in the Electric Motor Repair Co., same city, is named A. C. Line. That's an aptronym and a honey.

Gremlins Gum Up Big Book

Did you get any other complaints about the Jan. 7 issue being incomplete mechanically? I just got around to reading it, and when I looked for Van's editorial it was among the pages missing.

Do the gremlins get into your works, too?

-Hilary J. Berning, Tucson, Ariz.

There are more gremlins in a print shop than rats in an abandoned brewery. The gremlin that gummed up Mr. Berning's copy of the big book simply sat on a pile of forms at one station of the gathering machine, causing a skip.

All gawd's publishing chillum got gremlins. One of them caused the New York News to say recently:

Vollmer said police were seeking a 45-year-old man, employed as a point strayer.

Another is responsible for our referring two weeks ago to "one of Kipling's tails." C. H. (Eastman Kodak) Steele, A. L. (Taylor-Wharton) Bray, and H. Kelsea (Easton & Howard) Moore, Jr., remind us that still another gremlin made us imply that 25,000 lb. is the equivalent of 5 tons. Gremlin, of course, is just a fancy word for damned carelessness.

#### **Puzzles**

• • • We will print the cure to last week's headache when one of the master minds finds it.

This trifle, sent in by R. L. Farabaugh, of Barium Stainless Steel Co., you may have solved more than once in the past, but the chances are you have forgotten how you did it, so that makes it brand new:

With four straight, connected lines, go through each dot once and only once:



OF course, Fairbanks Scales are big, husky, and accurate. You have a right to expect these things in any good scale — and particularly of Fairbanks Scales with the world's broadest scale manufacturing experience behind them.

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The feature about Fairbanks Scales that may surprise you the most, is their ability to do things you don't expect of scales.

Here are a few of many jobs done by Fairbanks Scales:

- They count small parts more accurately than manual counting
- They weigh carloads of coal in motion and make a printed record of each weight
- They automatically control paint ingredients
  They automatically control aggregates
  They "keep the books" in steel plants, making
- They "keep the books" in steel plants, making printed records of incoming and outgoing shipments
- They keep accurate records on chlorination in water treatment
- They record the flow of liquid chemicals
- They guard secret formulas in compounding
- They control batching in bakeries
- They prevent disputes by eliminating the human element in weighing.

AND all of these things, only the beginning of the story, they do automatically and mechanically thereby eliminating human errors.

How Fairbanks Scales can be fitted into your production flow to speed up operations and eliminate errors may prove to be the most interesting discovery you ever made. Investigate now. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.



## FAIRBANKS-MORSE

DIESEL ENGINES PUMPS MOTORS GENERATORS SCALES WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT



Scales

# Dear Editor:

#### CORROSION TOLL

PLEASE WIRE YOUR ESTI-MATE OF ANNUAL COST OF CORROSION IN U. S.

HERB A. SHUTTS
MacFarland Aveyard & Co., 333 North Michigan Ave. Chicago, Ill.

• Most popular guess is one billion dollars yearly for the United States, and three billion dollars for the entire world.-Ed.

#### SHELL CLEANER

Sir:

Who makes Solventol, mentioned in the Jan. 21 article on cleaning 20 and 155 mm. shells?

Roll-Away Window Screen Co., 8th & Carlton Sts., Berkeley, Cal.

· Solventol Chemical Products Co., 1201 East Jefferson St., Detroit.-Ed.

#### LEICHNER PROCESS

Have you published any information regarding the Leichner process of producing maximum hardness in the cutting edge of alloy cutting tools? I understand that tools so treated are said to hold their cutting edge longer than carbide cutters.

New York

· We published nothing on this process and have no information on it, but would like to get some.-Ed.

#### SCREW MACHINE INSTRUCTION

On Feb. 4, H. J. Henke of Harper-Wyman Co., 8652 Vincennes Ave., Chicago, asked, "Do you have any literature on Apprentice Training for. screw machine operators?"

Since Mr. Henke's letter was published, we have received a copy of an excellent 18-page brochure compiled and issued by the National Screw Machine Products Assn., 13210 Shaker Square, Cleveland, entitled, "Methods of Selection and Training of New Employees."-Ed.

#### INDUSTRIAL DIAMONDS

I am busy designing some simple equipment to be employed for the low-cost production of synthetic industrial diamonds. Of course, you know that industrial diamonds have been produced repeatedly in the past, but at high cost. If you know anyone who would help me develop this interesting process, upon release, let

Attica Prison, Attica, N. Y.

#### CARD INDEX CATALOG

At one time you supplied a card index system showing where to buy. Would you be able to furnish a card index system covering up to date suppliers?

C. H. DECKER, Purchasing Agent

Acme Fishing Tool Co., Parkersburg, W. Va.

• We have no such service now, and no one now connected with The Iron Age recalls it .- Ed.

#### CAST IRON BORINGS

Please advise us of a source of supply on cast iron borings as used in heat treating. Also books on methods of heat treating.

R. E. AUSTIN

618 Bedford Ave., Bellmore, N. Y.

· Practically any sizable scrap dealer can supply borings. As to the best books on heat treating, we recom-mend two-volume set by Bullens of Battelle Memorial Institute, Columbus, Ohio.-Ed.

#### PRESIDENTIAL CANDIDATE

M. N.

After reading the article "1942" in your Jan. 7 issue, I am about ready to sponsor the writer for President. Any man who can use so many big words to consistently hit the nail on the head with facts, yet still keep enough humor mixed in to make a very timely article as thoroughly interesting as this one, should at least get some encouragement to "keep pitching".

EMMET UTTER,
Asst. Chief of Structures
Wichita, Kansas

#### WELD DISTORTIONS

You recently published an article regarding a process of electric heating of metals. A war plant here asked the writer to get information on equipment that would remove distortions due to welding in a part made of %-in thick steel, approximately cone - shaped and 12 - in. dia. Would you kindly let me know the name of a firm making this equipment?

W. E. SAYLOR.

Missouri Valley Electric Co., 1709 Locust St., Kansas City, Missouri

• Electric Arc, Inc., 152-162 Jelliff Avenue, Newark, N. J.-Ed.

#### TINPLATE SUBSTITUTE

Your recent article on bonderized and lacquered steel sheets and others

pertaining to scarce metal substitutes, food cans, phosphatizing methods etc., are of considerable interest to the writer. Is it possible to furnish reprints or tear sheets?

GORDON D. ZUCK Inland Steel-Container Co., 6532 S. Menard Ave., Chicago, Ill.

· Most of the information on bonderizing and lacquered steel sheets and other data concerning food cans, etc., appeared in the article, "Food In Cans," published April 30, 1942. A reprint of it is being sent you.-Ed.

#### "E" OMISSIONS

You are to be complimented on your very colorful and interesting issue of Jan. 7, 1943.

Our only disappointment was in not finding our name listed as a winner of the Army-Navy "E" award. Both our Indiana Harbor Works at East Chicago, Indiana, and our Granite City Works at Granite City, Ill. were given Army "E" awards on July 18, 1942.

American Steel Foundries, 410 No. Michigan Ave., Chicago, III.

• Our apologies. Omission was probably due to the fact that the list issued by Washington did not include those companies which first received the Navy "E" and later the joint Army-Navy award.-Ed.

#### SPRAYED METAL

We understand there is a process whereby metal can be sprayed on iron or steel and we are interested in knowing whom we can contact to get

further information.

PHILIP CLARE
Claremould Plastics Co., 135 Jackson St., Newark, N. J.

• Among the manufacturers metal spraying equipment are Metallizing Engineering Co., Inc., 2107 41st Ave., Long Island City, N. Y., and Metals Coating Co. of America, 3rd & Buttonwood Streets, Philadelphia.-Ed.

#### STEEL CHROMIZING

We are interested in steel chromizing as described by C. M. Cosman in your Nov. 26 issue.

Is this process being carried on commercially and where we can get more information?

United States Rubber Co., 6600 East Jefferson Ave., Detroit, Mich.

 Most of the work has been done in Germany, but there has been a revival of interest in the United States. Some recent work was done by I. R. Kramer and Robert F. Hafnir of the Naval Research Laboratory. The results of their experiments have been published by the American Institute of Mining & Metallurgical Engineers, 29 West 39th St., New York.-Ed.

# You can't negotiate with Sixty Seconds of 7ime

• Time has no favorites. But, time protects him who, when buying forgings, thinks clear through to the assembly line. A plus or minus sixty seconds of time, at each stage of operation in producing and finishing a forging, may make a vital difference in the time it takes to get the forging onto the assembly line. An urgent necessity in waging a modern war is the gaining of time. In sixty seconds a skilled T & W die designer may accomplish work that will save hundreds of hours in forging and machining a quantity of forgings. And dies can be the means of saving pound upon pound of critical metal. Forgings formed from T & W dies are usually formed to close tolerances. These forgings have the effect of increasing the capacity of both machines and skilled craftsmen. Ask a T & W Forging engineer about forging dies that usually save both time and metal.



T & W operates one of the largest and most skilled die making departments in the Drop. Forging industry. Utilizing the most modern die sinking machines, with which to accomplish the completion of dies in record time. T & W die making designers and craftsmen prepare matched dies for forging simple or complex forgings weighing from one ounce to eight hundred pounds.



# TRANSUE & WILLIAMS

STEEL FORGING CORPORATION · ALLIANCE, O.

SALES OFFICES: NEW YORK, PHILADELPHIA, CHICAGO, INDIANAPOLIS, DETROIT AND CLEVELAND

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# This Industrial Week . .

- Efforts Made to Boost Plane Production
- · New Orders for Steel Exceed Output
- Recovery of Idle Steel Strikes Jackpot
- Machine Tool Trends in Better Focus
- Ingot Output Unchanged at 99.5 Per Cent

B EHIND the scenes strong efforts are being made to improve the nation's airplane production by blasting bottlenecks which have persisted since the start of the war.

Steps to help aircraft producers by relieving the numerous "critical shortages" of alloy steel are understood to have been taken recently after a nation-wide investigation. Much of the trouble was traced to red tape at Washington, some of the fault was laid to airplane producers themselves and their subcontractors, and part of the blame was shared by raw materials suppliers. As many as several thousand individual reports of critical shortages of alloy steel have been on hand at one time.

Another bottleneck has been aluminum extrusions, which are reported to be in poor supply, followed by forgings. Plant capacity limitations are understood to lie at the root of these shortages. The aluminum sheet outlook is fair. Permanent mold castings of magnesium and aluminum are being used more and more in aircraft construction.

S EVERAL large steel companies this week reported new orders still above actual output by as much as 25 per cent. This means that backlogs are very high and in some instances unchanged from the December level. A surge in demand for steel drums is beginning to appear and steel for cartridges is being ordered heavily. The shipbuilding industry is calling for more steel steadily, most of the bulge coming from new yards. Much pre-fabricated shipwork is being done inland in the middle west, and some of the subassemblies are so large that special transportation arrangements have to be provided.

#### News Highlights in This Issue

9	9		
Cited for Award	84	Briefly Told News	120
Idle Steel Retrieved	97	100 War Contractors	122
About Ore Exhaustion.		Strikes in Canada	123
Prepared Turnings		CMP Trends	124
		Priorities News	128
Think About Production.		Nelson Dismisses	
Galvanized Output	106	Eberstadt	135
Steel Capacity Enlarged	106	Machine Tools	
To Poll Idle Tools	109	Non-Ferrous	
48-Hour Work Week		Scrap News	

The Government's recovery of idle steel stocks has reached a sales turnover of 5000 to 8000 tons of steel a day, indicating the truth of assertions that much steel has gone into inventories since the start of the war.

The steel recovery project centering at Pittsburgh has uncovered approximately 10,000 tons of stainless steel and 40,000 tons of structural material, and still has a dozen or more kinds of steel to survey. It is

# Plane Plants Face An Inquiry by Truman Group

• • • The Truman Senate War Investigating Committee will study airplane construction, particularly at the Willow Run Plant and at the Curtiss-Wright plant at Columbus, Ohio.
 Senator Truman said the committee would inspect

Senator Truman said the committee would inspect the two plants late this week and then would hold a hearing at Washington. "There has been little production at either plant," he said.

estimated that over 200,000 tons standing in stocks have been put up for sale in the past six weeks, in addition to 50,000 tons sold for re-melting purposes. At present, idle steel inventories are being bought by prospective customers by use of priority ratings. Daily inquiries to the Pittsburgh office of the Steel Recovery Corp. are at the rate of 600 or more.

ALL the facts which motivated the sudden 48-hr. week development by government officials have not been made public. Appraising the move on the basis of known data, many persons in the metals and metalworking industries feel it will mean a decided boost in war costs borne by the public, will mean little in the way of providing more skilled labor and may emphasize materials shortages which often have prevented higher production schedules.

From an overall standpoint, the steel industry already is producing at almost maximum levels. The industry differs from many others due to continuous operations in coke, blast furnace and open hearth departments. On a 48-hr. week, the continuous depart-

ments would need less men than were used on a 40-hr. week and unless losses because of the draft absorb the excess manpower there would not be enough work for all employees.

Individually, a steel worker making a dollar an hour on a 40-hr. week would gain \$12 per week of 48 hr. This, however, might not mean that the steel company payroll would go up this much because it would need less men under a 48-hr. week in order to maintain the same maximum output.

LAST week's announcement of further concentration in the steel industry fomented again discussion over how far the Government might go in restricting output of certain items in the hands of a few mills, setting up delivery territories and otherwise transforming the industry for the duration. Ever since war began, speculation has been bobbing up concerning this subject. In January, rail steel bar mills were given a break over billet steel reinforcing bar producers and now galvanized sheet production is being detailed to a portion of producers of the product. Some authorities look for an extension of the trend in the steel industry this year.

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The uous departIn the machine tool field, trends which for some time have been imminent were put into better focus by two announcements last week. The National Machine Tool Builders Association asserted the industry has now completed the major portion of its job of retooling America for war and before the year is over will be looking for more work. Individual companies already have made progress in lining up machining contracts. The new government order covering transfer of idle machine tools had been expected for some time. It is designed to assist plants needing machine tools by enabling them to draw upon idle machines.

Two actions by WPB last week will help ease the steel supply situation in two fields. Restrictions have been modified on the use of concrete reinforcing bars

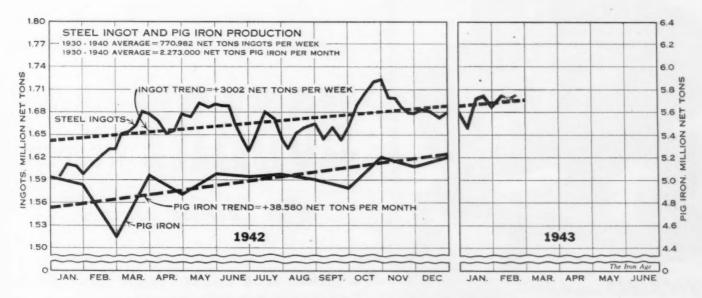
#### 1000 Ships Launched by U.S. Yards

• • • The S. S. "Edward Livingston," launched this week, was the 1000th ship to take to the water for the U. S. Maritime Commission in the United States since Pearl Harbor. The 10,500-ton vessel, a Liberty cargo ship, was constructed at the California Shipbuilding Corp. yard, Terminal Island. It was the 138th to be produced by the Los Angeles Harbor shipbuilding plant.

to permit their use on a wider range of projects. Farmers are to benefit through the relaxation of several orders controlling agricultural equipment.

More information on the all-important Controlled Materials Plan was pushed out last week, including the long awaited regulation covering repair and maintenance parts. A new Class B list is being prepared, although it probably will not apply until the time arrives for filing applications for third quarter. The procedure for advance allotments of steel, aluminum and copper was covered last week, also.

HE nation's steelmaking rate remains at 99.5 per cent of rated capacity for the fourth consecutive week. Chicago operations have gained one point to 101 per cent and in Detroit the rate has increased two and a half points to 104.5 per cent. The melting rate at Cincinnati has jumped five points to 105 per cent while in the East schedules have improved six points to 100 per cent. Ingot production in the Pittsburgh district has fallen off half a point to 101 per cent and in Youngstown operations have dropped a full point to 101 per cent. The Wheeling rate has sagged three points to 87 per cent while at St. Louis the rate is off two points to 104.5 per cent. At Philadelphia output is unchanged at 92 per cent. Other districts continuing at last week's rate are Cleveland at 97 per cent, Birmingham at 102 per cent and Buffalo at 104.5 per cent.



#### Steel Ingot Production by Districts Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	S.Ohio River	West	St. Louis	East	Aggregate
February 11	101.5	100.0	102.0	92.0	97.0	104.5	90.0	102.0	102.0	100.0	102.0	106.5	94.0	99.5
February 18	101.0	101.0	101.0	92.0	97.0	104.5	87.0	102.0	104.5	105.0	102.0	104.5	100.0	99.5



# News of Industry Report on News of Industry Report on News of Industry Report on News of Industry Report on

# 240,000 Tons Standing in Stocks Put Up for Sale in Past Six Weeks

By T. C. CAMPBELL
Pittsburgh Editor

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• • A sales turnover of from 5000 to 8000 tons of steel a day, a flow of inquiries reaching a daily total of 600 or more, and close harmony between three branches of the government—these answer critics of the steel recovery project launched several months ago.

This three-ring circus is playing to a full tent with satisfied customers asking for more of the same thing. Under the "big top" at Pittsburgh the outstanding performance is the cooperation between the three organizations which have been charged with the gigantic job of tabulating and finding outlets for all the idle and excessive steel stocks in the nation.

The Materials Redistribution Division of WPB acts as the "purchasing agent" in finding the material, the steel recovery branch of the WPB steel division has charge of pushing sales of material in an "as is" condition, and the Steel Recovery Corp. buys and sells inventories for remelting purposes. Catalogs have been made up and distributed showing stocks available.

The recovery project acts as a catalytic agent in the matter of disposing of steel in an "as is" condition. It brings the holder of the material and the prospective buyer together. The rest is up to these two. So far the recovery organizations have not had to resort to requisitioning in one single case.

As important as the disposal of the thousands of tons of steel that has taken place since the steel recovery project got under way is the fact that less than one-fifth as much steel has been bought for remelting purposes than has been put into industry in an "as is" condition. Even in the case of the stocks bought and sold for remelting purposes the total tonnage

involved was voluntary action on the part of the holders of the material.

Criticism of the recovery groups has been that they have moved too slowly and that by the time they began functioning the demand for steel and scrap would have passed the peak. This has not been substantiated by the facts. Officials say that initial steps were slow because of the gigantic task involved in tabulating more than 150,000 preliminary queries and returns.

While some of the long-haired fra-

ternity at Washington are of the opinion that the results of the Steel Recovery Plan so far have been behind expectations, those familiar with the requirements of such an undertaking feel that the schedule is going along on time. The location of these agencies at Pittsburgh instead of in Washington probably has freed officials and workers from drawbacks encountered at the Capital so that full steam could be applied on the job itself and thus eliminate the chance that details and policies might, predominate the project.

At any rate, at least six major steel product programs are now under way and these account for the major portion of idle steel stocks in the country. The first program involved stainless steel stocks and has been completed. Catalogs have been sent out and sales are being made every day as the result of this study. Approximately 10,000 tons of stainless steel products have been uncovered and are recorded in tally sheets in an "as is" condition. Inquiries are coming in daily from the armed forces, the various claimant agencies and from prime contractors. Very little stainless steel has been sold for remelting purposes.

The steel recovery plan has given birth recently to a new "child" in the form of "purchase for reprocessing." Where stainless steel stocks are too small in size or quantity for selling

#### How Manufacturers Can Assist Steel Recovery

Pittsburgh

• • • Those taking advantage of the Steel Recovery Project can assist by reporting to SRC at 5835 Baum Boulevard, Pittsburgh, Pa., any tonnage which has been used by plants which had previously reported such inventory to SRC as idle and excessive. In this way SRC will be able to revise its catalog listings and the material removed as available supplies.

Since buyers who purchase idle stocks on priorities of AA-5 and higher do not have to have permission from WPB to make such purchases, they are urged to report to SRC at Pittsburgh what materials have been bought. In this way they too will help keep the records straight as SRC can remove the purchased material from the catalog. An invoice of the sale will be sufficient information for SRC.

in an "as is" condition and where the tonnage is too small or scattered all over so that remelting purposes would not be the answer, the Steel Recovery Corp. has bought much of this material for reprocessing. It is sheared, rerolled or reprocessed into sizes and shapes that can be used by the armed forces.

The armed forces buy this as new material from SRC thus saving the load on new steel requirements. The trimmings and other scrap resulting from the reprocessing are sold by SRC for remelting purposes. This novel setup is bound to spread to other recovery steel product programs since it is more economical to reprocess this type of material so that it can be sold as prime stock than it would be to buy and sell it for remelting purposes. SRC officials buy and sell inventories for remelting purpose only as a last resort and to date not more than 50,-000 tons has gone this way. This reprocessing idea looks as if it would "take on" and result in the armed services getting material that otherwise might be hard to obtain.

The second program to be started was structural steel and latest information indicates that this is about half completed. The tabulation covers more than 40,000 tons of material It has been pointed out that catalog sheets are made up as soon as there is enough steel uncovered to make a case. It has been learned that 48 hours after information has been received by the steel recovery groups it is in the catalog and the information available to prospective buyers. In other words, the catalogs are built simultaneously with the receipt of incoming information. Every item that is being processed, even though the program is merely starting, is made available for sale in an "as is" condition.

Other programs started and their status are as follows: Bars, hot and cold rolled, about 50 per cent com-

EXCESSIVE INVENTORIES: The Steel Recovery Corp. issues bulletins listing available inventories when programs are completed. Inventories of 15 to 20 different types of steel are expected to be charted finally. The material is located at various places in the United States and is available for sale on orders bearing proper preference ratings.

pleted; sheets and strip, about 25 per cent completed; pipe and tubing about 20 per cent completed; and alloys about 10 per cent completed. All of these studies will be completed within the next 60 to 90 days. This will mean that the greater part of the "hump" has been gotten over. Other programs are on their way but these probably will be held back until some of the ones now being studied have been set up in complete catalogs.

(A program is completed when all the returns are in and tabulated which were originally sent out on a specific steel product program.)

One significant change has been made recently in the distribution of the sheets showing the stocks available for buyers. The whole distribution plan has been decentralized with regional WPB men to be given catalog pages showing stocks available in their territories. In this way the prospective buyers in areas where certain stocks exist will have first crack at it thus cutting down detail and cross hauling.

If a Chicago manufacturer is interested in finding what idle stocks are available he will get that information from the Chicago Regional office of

• • • Still in its early stages, the steel recovery program already has uncovered large tonnages of steel from idle stocks. Are implications which were faint a few months becoming clearer? This story contains much valuable information for steel users.

the WPB. In case what he wants cannot be had in his own area his regional office can contact the SRC at Pittsburgh which will attempt to locate the material. By decentralizing the distribution of information on idle stocks it is believed that a more economical and more efficient handling of the inventories will result.

The niche that steel recovery will take in the CMP is not yet decided. It is hoped by many steel consumers that SRC will be used as an emergency crew, or a trouble shooter rather than as a part of the CMP. In other words, the vast amount of idle stocks that have been tabulated and are available for sale should be used in those cases where an emergency exists and where the obtaining of this material would save time and greatly further the war effort. For instance there might be cases where only a small amount of strategic material is needed. It may be a matter of grave importance, and rather than wait until new steel is made the SRC could come into the picture and be the means of meeting this emergency.

At present steel inventories can be bought by prospective customers by use of priority ratings. In the case of orders carrying AA-5 and higher it is not necessary to obtain approval from recovery agencies. In other cases the WPB must give approval before sales are made by the holder of the material. It is significant that of all the prospects the steel recovery agencies have put in touch with holders of material, more than 75 per cent of the deals have clicked "right off the bat." The few remaining cases where there has been haggling have been settled rather promptly.

In the past month and a half the steel recovery groups have handled daily about five to eight thousand tons of steel, or in other words that much steel has reached the point daily where buyer and seller have been brought together. This rate of turnover is ex-



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VER 1,000,000 PATTERN COMBINATIONS . in our files. Very likely there is on hand the solution to your own special. ized problem! Call Medari for special equipment.

today is more purposeful . . . supplying special machinery for today's specialized jobs. Some of the special machinery created by Medart during the past year includes:

- \* An automatic machine for straightening rifle barrels.

  \* A mechanism for driving a portable 1000 H. P. generator with ten 100 H. P. diesel engine.

  \* A machine for de-rodding metal tubing.

  \* A billet cold centering machine for tube mills.

  \* A 400 H. P. gear reduction unit for a stern wheel towboat.

  \* Mechanical driving units for agitator tanks.

  \* Automatic bar feeding table.

  \* Automatic bar delivery and storage tables.

  \* Bar cradles.

- ★ Bar cradles.
  ★ Chain wheels.
- ★ Furnace car bearings.
  ★ Furnace door frames, etc.

Manufacturing Engineers of Complete Transmission Equipment and Specialized Machinery

EDART

pected to increase as the various programs become completed. Roughly speaking, it is estimated that close to 240,000 tons of idle steel stocks have the WPB. In case what he wants cannot be had in his own area his been put up for sale in the past month and a half (buyer and seller have been brought together) and this does not include about 50,000 tons sold for remelting purposes.

Steel recovery people both at Pittsburgh and in regional offices report that holders of idle stocks have been most cooperative. The response has been far better than expectations and the fact that no "tough" handling was necessary proves the success of the venture. Those who have seen the recent working of the steel recovery program note particularly that the realistic approach to a large job like this is now paying dividends. Even

those who attempted to pour cold water on this venture are now enthusiastic about the use it will play in the war effort. Those who predicted a wholesale consignment of steel stocks to the open hearth must have been disappointed to find that the interest of prospective buyers was so high THAT THERE WAS NO CHANCE FOR STEEL RECOVERY TO USE SALESMEN TO WHIP UP SALES PROSPECTS. In fact, the offices here at Pittsburgh are far behind in servicing the 600 or more inquiries that roll in each day. More than 100 of these come from the Army and Navy which send spotters over to the headquarters to make sure that they are informed of new material prospects. The other 500 inquiries a day come by mail, phone and telegraph to the SRC headquarters at 5835 Baum Boulevard, Pittsburgh.

the decline in estimated reserves from the peak reached over 20 years ago has been considerably less than the amount of ore shipped from these properties is sometimes cited in support of claims that reserves have been underestimated. Thus, estimated iron ore reserves of Minnesota declined 318 million tons from 1916 to the beginning of 1942, as compared with shipments during this period of about 890 million tons. Similarly in Michigan, estimated reserves dropped only 79 million tons while shipments totaled 316 million tons. It must be recognized, however, that each year of additional exploration and re-examination of company records should make the information on reserves more nearly accurate.

"Estimated reserves of high-grade ore in the Lake Superior district amounted to 1.3 billion gross tons at the beginning of 1942, based on tax commission records. While this estimate is regarded as conservative, the margin to be allowed for future discoveries and additions to supplies is a controversial issue. Numerous deposits of ore are found in other sections of the country but for many years they supplied only about 15 per cent of the steel industry's annual needs. Tax commission records place reserves of open pit ore in the lake district at 569 million gross tons, equal to 44 per cent of the region's total reserves.

"This year's needs are estimated at 100 million tons, a figure expected to be the minimum demand for the duration. Mesabi is expected to supply over three-quarters of the district's shipments, with open pit ore requirements placed at 53 million tons in 1943 by E. W. Davis in his report to the WPB. Because of its great resources of open pit ore, Mesabi is the only range which can produce very large quantities of high-grade ore on short notice.

"Development of a large taconite concentration industry at Mesabi is Mr. Davis's principal recommendation for overcoming the high-grade ore shortage which he believes will occur in a relatively few years. Magnetic taconite reserves, which can be concentrated by commercial methods now in use, are placed at from 5 billion to 10 billion tons. The major drawback of Lake Superior taconite is its hardness, and costs of beneficiation would be too high to permit commercial exploitation at present ore prices, Large capital investments would be required, with estimates ranging from \$6 to \$10 per ton of annual capacity."

### Danger of Iron Ore Exhaustion Not Immediate, New Report Asserts

• • • The National Industrial Conference Board, Inc., New York, after several months' study by H. E. Hansen, has concluded that there is no immediate danger of a shortage of high grade ore in the United States, even if a wartime consumption rate of 100 million gross tons a year con-

For several months a controversy has been underway concerning Lake Superior iron ore reserves. On one side, certain experts pointed to rapid depletion of high grade ores and urged immediate and liberal government financial assistance leading to the use of low-class ore known as taconite which exists in tremendous quantities. On the other side were authorities who couldn't get excited about the matter at this time. The Conference Board report seems to strike middleground.

"Whether exhaustion of high-grade open pit mines occurs in 1950, 1954, or some later date is a matter of controversy," it is said in the report.

"But it is generally agreed that with proper advance planning sufficient ore can at all times be produced to take care of all needs likely to arise. Costs, however, are expected to be higher than today."

With costs up the resulting financial problems confronting individual companies would, in such event, vary greatly, the report said.

"Controversy over the life of present high-grade reserves arises as a result of differences of opinion of the accuracy of both reserve and future production estimates. The fact that

#### Average Production Costs of Open-Pit and Underground Ore Produced in Minnesota, 1932-1941 Inclusive

Conference Board Source: Mining Directory of Minnesota, 1942 Per Gross Ton

	~ .		MI	NING COS	TS			
	% of Total Output	Develop- ment	Operating Labor	Operating Supplies	Misc.1	Benefi- ciation <sup>2</sup>	Royalties <sup>3</sup>	Total
Open Pit Operations 10-Year Average	87.3	\$0.22	\$0.13	\$0.11	\$0.18	\$0.09	\$0.40	\$1.13
Underground Operations 10-Year Average	12.7	0.06	0.89	0.48	0.34	0.03	0.41	2.21

Includes administration expense; depreciation of equipment.
2 All costs of beneficiation, such as labor, taxes, supplies, interest on investment, etc. The figures represent the cost of all marketable ore produced, on an average per gross ton and therefore are not indicative of the actual cost of the ore treated.
3 Includes royalties chargeable to current production; the tonnage of fee ore included in the production averages about 2 per cent of the annual production.



dreams of Watt or Diesel or Edison. . . . In an ordinary glass of water is the potential power of a billion kilowatt hours!

When will industry be able to harness atomic power? Possibly in six months, six years, or not for six decades, but of this you can be certain: One day, just as sure as the earth revolves about

not for six decades, but of this you can be certain: One day, just as sure as the earth revolve the sun, every form of power machinery in use today will be totally obsolete.

This story of atomic power is only an extreme illustration of the problems.

This story of atomic power is only an extreme illustration of the problems that industry faces as a result of *change*.

Today, we are living in the midst of far greater and swifter change than the average business is prepared for. As a result, many businesses — seemingly on the rise — are actually on the brink of failure in the new world of post-war production.

If your business is manufacturing with metal . . . and if you are planning ahead now . . . there is one thing that you can do to protect your business against failure to keep pace with changing methods of production: Consult with the leading specialists in machine tool engineering!

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THE IRON AGE, February 18, 1943-101

## Lack of Market, Even for Prepared Turnings, Adds to Segregation Troubles

• • • Scrap steel turnings, which are now being produced at a rate of 100,000 to 150,000 tons a month from alloy steels and in somewhat larger tonnages from carbon steels, are bringing headaches all round, and acute migraine to turnings producers.

A very incomplete job is being done on segregation, partly due to the attendant difficulties and partly due to the fact that in many cases scrupulously segregated and prepared turnings are not finding a market. For example, both Packard and Cadillac, with model segregation and preparation facilities, experience difficulty in getting rid of their turnings.

The scrap division of WPB's Iron and Steel Branch takes the position that there is no turnings problem of any sort. The alloy division takes the position that the problem is solely one of segregation. But to producers, the frequent inability to obtain allocations for their turnings and apparent lack of official interest in their plight loom largest. As an extreme example, one automotive company which installed segregating, cleaning and briquetting, equipment on WPB advice, upon complaining that the prepared turnings were not moving satisfactorily, was told that maybe it should stop briquetting.

The problem, which apparently exists throughout the country, seems to be most acute in the Detroit area and on the Pacific coast. In the west, it

is reported that in many instances producers can have their turnings scrap taken by dealers only by hauling it themselves, at a cost exceeding the price it brings them.

A number of suggestions have received government attention since mid-November, when the problem first began to become pressing. One of these which has reached a stage of formulation as an order is that steel mills be required to use turnings in a proportion of at least 8 per cent of the ingot weight in open hearth charges. With alloy steel production at a rate of 1,000,000 tons a month or a little better, this would take care of about 80,000 tons of alloy turnings a month. Whether or not the order will actually be issued is at present anybody's guess.

Another suggestion which has found less favor is that the mills be further restricted in the amount of virgin alloying agents they receive, forcing greater use of alloy turnings. At present, turnings are a partial source of nickel, molybdenum and chrome and in some cases mills have had difficulty in keeping nickel and molybdenum down to the low NE steel specifications. There are also reports of bad heats on account of contaminated turnings.

A third suggestion which has aroused considerable interest is that two blast furnaces, one in the east and one in the mid-west, be set aside to make alloy pig iron from turnings. A similar process was used in the last war by Bethlehem to recover armor plate alloy.

Also receiving consideration is a loosening of restrictions on material for cupola furnaces of sash weight makers.

Opposed to these suggestions is a feeling in some WPB quarters that somehow time will take care of the question without any specific action being necessary. The father of this opposition is said to be the viewpoint of steel mills that as far as they are concerned there's no problem. They can still get alloying agents, which makes manufacturing of steel a simpler operation, and solid scrap is still obtainable.

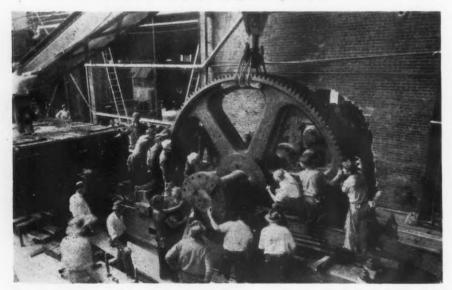
As for the segregation problem, it too is full of knotty difficulties. All producers of turnings in excess of one ton a month are required to segregate by alloys, but enforcement of this requirement is particularly difficult among small producers and in crowded machine shops. The care required is considerable, to say nothing of the ingenuity and equipment. The problem extends to the scrap dealer, whose job of continuing segregation of the relatively small lots received from such producers is made doubly difficult if the turnings are slow moving.

The most serious contamination of turnings, it is said, results from high molybdenum and nickel steels required under Army and Navy specifications. One school of thought believes that this problem can be solved only by lowering specifications of the original steels. Whether or not such changes will be made is, again, anybody's guess though it is widely held that eventually they will.

As for briquetting, it is recognized that only a portion of the material can be so treated. There just isn't equipment for anything like complete briquetting. Baling offers more possibilities, particularly with the recent OPA permission to incorporate binding scrap.

On only one aspect of the turnings mare's nest is there complete concurrence. Everyone concerned agrees that the material, with its valuable content of badly needed alloys, must find its way to the furnaces. Some idea of what is involved is conveyed by the following estimates: Of carbon steel reaching the machine shop, 25 per cent becomes turnings; of alloy steel reaching the machine shop, about 48 per cent becomes turnings; of some aircraft steel, 75 per cent becomes turnings.

14-DAY ACHIEVEMENT: Copperweld Steel Company's crews rebuilt this entire 29-in. mill in a period of 14 days. The mill was removed from its foundations, the foundations dynamited, new ones poured and the re-built and remodeled mill set in place and put in operation.





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These cold working die steels are specially adapted for individual applications in consideration of hardness, wear resistance, distortion, machinability, toughness, and cost. The Jessop representative is a trained steel man; he will gladly recommend the type best suited for your particular needs. Jessop Steel Company, Washington, Pennsylvania.

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### Think Harder About Production, Plant Drive Committees Are Urged

• • • Too many war production drive committees are concerning themselves with morale building activity instead of spending more time in development of more efficient production methods, Harold J. Ruttenberg, assistant to the director, steel division, WPB, and United Steelworkers official, charged in Chicago last week at the American Management Manpower Conference.

Mr. Ruttenberg, who chose to call these committees, the "Nelson committees," said that the record so far is not uniform and that some of the committees are successful while others are a failure. "The job of production is not the exclusive responsibility of management, it is joint," he said and cautioned management against overloading the capacity of the production drive committees.

He also warned that management should not leave to the government the responsibility of obtaining cooperation between employees and management, and urged that it should be a voluntary matter.

In starting his discussion, Ruttenberg expressed sympathy for those companies which did not have unions and caused a considerable ripple of "commotion" when he said that in his opinion such companies were handicapped in production.

From 8 to 9 million more persons must be employed within two years after the war than had jobs in 1940, H. B. Folsom, Eastman Kodak Co., told the conference. Folsom claimed this was a problem for industry to solve and stated that government public works cannot possibly provide more than a small percentage of these jobs. Admitting that there will be greatly expanded markets in post-war years, he said the problem cannot be met unless individual enterprises throughout the country start to plan now for postwar production and marketing, but added that even this depends upon a favorable attitude during the postwar period for the expansion of business

How the split-shift or half-shift plan has worked for Warner & Swasey Co., Cleveland, was outlined by Walter C. Mason, assistant employment manager of the company, in an address which many deemed highly interesting.

Warner & Swasey found there was a practical and tangible result that could be attained through the employment of white collar workers, he said.

"The plan was devised to utilize white-collar workers who had had no direct part in the war effort," he said. "Since these men were already employed during the day in various civilian pursuits, an eight-hour shift, from 4 p.m. to 12 midnight, was split into two equal parts, namely, 4 p.m. to 8 p.m. and 8 p.m. to 12 midnight.

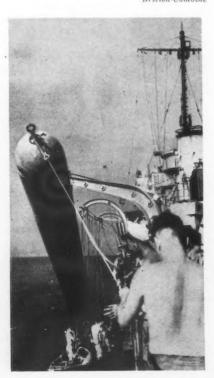
"Initially, during the latter part of October, 1942, five two-man teams were created, each man working only four hours. One member of each team worked from 4 p.m. to 8 p.m., then was relieved by his team-mate, who carried on from 8 p.m. until midnight. Each man was employed with the understanding that he would work six days per week, Monday through Saturday.

"On Feb. 8 of this year, there were 155 of these two-man teams, or more than 310 men, working under the half-shift plan, each doing a daily four-hour bit, six days a week.

"That we are pleased with the results of the half-shift plan is evidenced by the growth in teams since

TORPEDO ALONGSIDE: An impressive view of a 21-in. torpedo as it is hoisted aboard a British destroyer from the whaler which recovered it after a torpedo exercise.

British Combine



the initial or experimental stage. One team is made up of a president and combustion engineer from a retail coal company; another consists of a high school teacher and a printer, and still another is made up of a cartoonist and a manager of a large restaurant.

"Many of these men bring to their new war-time jobs, a relatively high level of intelligence. This tends to offset, in part, their lack of previous shop experience.

"Our four-hour men are assigned to jobs in the assembly and machining departments. In view of the type of work to which they are originally assigned, it is not necessary for these men to have previous factory experience; and, in fact, require comparatively very little mechanical ability. These men enter our service as learners, which means we must teach them everything.

"We exercise extreme care in properly acclimating the men to the shop and shop personnel because in practically all instances this is the first time that any of these people have ever been within the walls of an industrial concern.

"For two or three days, the foreman and assistant foremen maintain close supervision over these new men. If they do not seem to be adapted to that type of work they may be moved to another type of job.

"We find that the split-shift men now operating machines are doing an excellent job and have exceeded our expectations.

"One interesting sidelight in the success of the experiment is the fact that 90 per cent of the men employed on these half-shift jobs have applied for work in order that they may feel they have some important part in the war effort; 5 per cent of the applicants state they expect they may later be forced to take jobs in war plants anyway; while 5 per cent have applied for monetary reasons.

"The rate of absenteeism among this group is less than one-half of one per cent.

"It is estimated that there are, at least, 10,000 men in white-collar positions within greater Cleveland available for work of this or similar nature. This represents a potential of 40,000 man hours of work per day.

"If 10,000 such men worked four hours a day—six days a week in greater Cleveland war production plants, it would add 240,000 man hours of work per week to greater Cleveland's war production program."

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Electroweld Steel Corporation has a large capacity devoted entirely to the war effort . . . Another mill, now under construction, will increase greatly Electroweld production. When victory be ours, we

believe that this excellent product will prove advantageous in your peacetime operations.

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## Long-Awaited WPB Order Concentrates Galvanized Output

Washington

• • • The Steel Division has ordered the concentration of galvanized steel sheet production to eliminate any possible interference with the production of steel plate and heavy hot rolled sheets, H. G. Batcheller, division director, announced Feb. 11.

This step will release the rolling facilities of several leading galvanized sheet manufacturers for plates and the heavy hot rolled sheets which are urgently needed in various important war programs.

Early this week, no indication had been given of which mills would take over the concentrated production, and mills which presumably will be affected were still up in the air. Since galvanized sheet production in hand mills has been kept up at the expense of production in continuous cold rolling mills, it was generally guessed that the hand mills would be chosen to continue galvanized production. This was questioned in some quarters, since cold working mills cannot be very well converted to hot rolling, while the hand mills are hot working mills, but it was pointed out that hot mills have to supply the cold galvanizing mills.

Chicago reported that the order was an anticlimax, as two large producers halted production in December and January. It was also said that one large company in the East and one in Ohio would be permitted to continue rolling galvanized sheets, to prevent cross-hauling.

The order did not come as a surprise, since production of some mills already had been much restricted, and since a precedent for such action had already been established by WPB's action on Jan. 11 in concentrating a large part of the limited production of concrete reinforcing bars in mills located in California, Washington and Oregon.

Mr. Batcheller explained that in putting the program into effect, production of galvanized sheets has been ended in some of the principal producing areas, notably the Chicago district. However, the amount of galvanized sheets which will be produced under production directives issued by the Division will about equal the tonnage which has been rolled by all producers in the last few months, and will be sufficient to meet all war needs and essential civilian demands.

Because production will be concentrated where it will not interfere with urgently needed products such as steel plate, some buyers of galvanized sheets may find their regular sources of supply unable to accept their orders. Buyers, therefore, should place their requirements with other producers located as close as possible to the point of delivery. The Sheet and Strip Section of the Steel Division will assist buyers in locating new sources for galvanized sheet, Mr. Batcheller said.

# \$1.2 Billion Spent By Steel Industry to Enlarge Capacity

• • • Steel companies have invested nearly \$1,205,000,000 of their own funds to increase capacity and improve their equipment since 1938, the year in which Hitler moved into Czechoslovakia and Austria, according to the American Iron & Steel Institute.

Approximately \$432,000,000 or about one-third of that total was spent dur-

ing the years 1938 through 1940 when hostilities were beginning.

From 1941 through 1943, the industry spent or is preparing to spend a total of \$773,000,000—not far from twice the amount spent in the preceding three-year period.

The industry's own expenditures for this purpose were augmented, beginning 1941, with appropriations from government funds to install certain new equipment wanted for war work.

The combined total of government and private expenditures contemplated for 1943 to expand and improve iron and steel plant facilities is nearly \$650,000,000.

About 30 per cent of that total will be devoted to installing additional blast furnace and steelmaking capacity of American iron and steel plants.

Another 15 per cent will be used to provide additional rolling mill facilities, and the remaining 55 per cent will be spent to install other needed equipment, mostly in finishing.

When the present program of expansion is completed, some time this year, blast furnace capacity will be 20 per cent greater than it was on Jan. 1, 1938.

Open hearth steel capacity will be about 18 per cent greater, while electric furnace capacity will be almost  $3\frac{1}{2}$  times what it was at the beginning of 1938.

### Aircraft Rivets Sorted by Machine

Detroit

• • • Virtual elimination of rivet wastage is reported by the Fisher Body Div. of General Motors by means of a new rivet sorting machine which daily classifies many thousands of aircraft rivets. Blueprints of the machine are being made available to other aircraft producers by Fisher.

The rivet sorter comprises a battery of four machines, each having a primary selector consisting of a perforated revolving cylinder. The perforations in each cylinder are of different sizes, so the rivets which fall from each are grouped according to thickness regardless of length or head type. Cylinders are interchangeable so there is one to match every rivet thickness used in the plant.

After sorting according to thickness, rivets are dropped into a hopper from which they are carried on a pronged trough to the next selector operation. At the bottom of the

trough the rivets, with the heads upward, reach a flat disk-like selector which is notched and revolves constantly.

Each rivet slides into one of the notches. Then, as the selector turns, the various head types are kicked off by selector arms. If the machine is set for selection of round head rivets, all other types are kicked off into a container, round head rivets continuing on for selection as to length. After selection of round head rivets, the machine is set for flat head or other types of rivets, and gathers them in the same manner.

The third phase of the operation consists of sorting according to lengths. Extending from the circular selector are a dozen or more small channels. As the selector revolves, needles kick out the rivets according to their individual length

Average savings at the Fisher Aircraft plant are figured at approximately 200 lbs. of sorted rivets daily.

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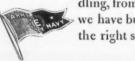


Like the Navy's Seabees, these Roebling wires are trained and ready for anything... from speeding output of production facilities to making a position

secure for front-line fighters. For example, this Flat Wire for flexible steel tapes and rulers.

It must withstand constant jerking, coiling, tangling and bending in service...so it meets extremely severe specifications of resiliency, tensile strength and temper. It must be turned out on high speed production machines, without rejects...so every inch is very accurate dimensionally and notably free of defects on the surfaces and edges.

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dling, from steel-making to final inspection. And we have built a reputation for delivering them to the right standards for war work... on schedule!



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#### Alloy Steel Output In 1942 Sets Record; 40% Gain Over '41

• • • Responding to urgent demands for alloy steels, the steel industry of the United States produced in 1942 the record-breaking total of 11,351,000 tons of high-strength, high-quality alloy steel ingots and castings, according to the American Iron & Steel Institute.

The tonnage produced last year was nearly 40 per cent greater than the previously reported peak of 8,206,000 tons produced in 1941, and was nearly four times the tonnage needed to meet average yearly alloy steel requirements in peacetime.

From 1910 to 1913, an average of only 716,000 tons of alloy steels was produced per year, equivalent to only about one ton of alloy steel in every 50 tons of total steel production during that period. By 1918, production had increased nearly three-fold to 2,002,000 tons. In that year, about one out of every 25 tons of steel produced was alloy.

In the peace years that followed, the automobile industry became an important consumer, while other large tonnages were used in machinery and in various industrial applications. Peak peacetime use of alloy steels came in 1929, when 4,432,072 tons were produced, or about one in every 14 tons of total steel production. That production stood as the peak until 1940.

The record production achieved in 1942 meant that over the entire year somewhat more than one out of every eight tons of steel produced was alloy steel. Actually at the end of 1942, the rate of alloy steel output had increased to one out of every six tons of steel produced, and for 1943 alloy steels seem destined to be an even greater proportion of the total production.

#### A.S.T.M. Issues New Pamphlet

• • • • A new pamphlet published by the American Society for Testing Materials, Philadelphia, contains 21 extensive but compact tables and 26 charts and curves on the chemical composition, physical properties, forging and heat treating practices and mechanical properties of steels. The booklet is divided into two parts; the first pertains to wrought chromium steel while the second covers wrought chromium-nickel steel. Copies can be obtained from the A.S.T.M. at \$1.25 a copy.

# WPB Moves to Pool Idle Tools As Aid for Plants Needing Machines

prompt transfer of idle machine tools to plants urgently needing them has been established by the WPB following consultations with the War and Navy Departments and the Defense Plant Corp. The step was recommended by the productive executive committee set up in WPB under the chairmanship of Charles E. Wilson, vice-chairman in charge of production. The policy is expressed in a directive given herewith.

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WPB, through its tools division, will direct the procurement agencies to transfer available tools when new tools cannot be delivered quickly enough to meet requirements. The directive points out that most machine tools purchased for war production have been financed by the government. It is primarily toward the use of these that the order is directed.

The directive follows:

- 1. As a result of changes in program schedules, increasingly efficient operation, and development of new production techniques, many machine tools heretofore delivered have been rendered idle, or are in use on purposes less essential to the war effort than others for which they are urgently needed.
- 2. To release all possible materials for other purposes and to bring about the production of articles of war in accordance with strategic military determinations, maximum utilization of existing machine tools must be secured.
- 3. Machine tools recently purchased have been largely Government financed; when in conflict with the attainment of maximum utilization, the right to present or future ownership and the right to possession or use of any particular machine tool by any person, including any Governmental agency, department, or corporation, are deemed subordinate.
- 4. The WPB is the agency responsible for developing information regarding existing machine tools not required in their present location, and is responsible for exercising overall supervision of the distribution of machine tools.
- 5. Accordingly, the following policies have been established by the WPB in consultation with the War and Navy Departments, and the Defense Plant Corp.

(a) The WPB may direct the transfer of any machine tool not in use or from use on any contract, purchase order, program, or other work regardless of ownership or contractual rights relating to the possession or use of such machine tool, to use on any other contract, purchase order, program or other work in the same plant or any other plant. The direction of the WPB will be addressed to the departments or agencies primarily affected and a copy shall be furnished to the holder of such machine tool.

- (b) The Tool Division of the WPB shall issue such a direction only after consultation with the War Department, the Navy Department, or any other Government agency, or department the performance of whose contracts may be affected by such action. Consideration shall be given to the effect which such transfer will have on respective production programs, under the general policies directed by the Production Executive Committee.
- (c) The guiding principle shall be that upon the issuance of such a direction the transfer of the machine tool in question shall be made promptly. Accordingly, every effort must be exerted by the Governmental agency concerned to obtain the consent of the holder of the machine tool to its immediate transfer. Adjustments between Governmental agencies necessitated by the transfer and likewise negotiations between such agencies and the machine tool holder with respect to the modification of any con-

tract under which the machine tool is used or of any contract for the production of material with such machine tool shall, insofar as possible, be conducted after the transfer.

- (d) If the consent of any private interest deemed necessary to the transfer of the machine tool cannot be obtained, or if the transfer is not accomplished with reasonable dispatch, the WPB will issue such orders as may be necessary to effectuate the transfer. When necessary, the machine tool shall be requisitioned pursuant to the Act of Oct. 16, 1941, as amended.
- (e) Reserves of machine tools retained by contractors against the possibility of future need for tools shall not be permitted if such tools are needed for other contractors. The execution of the policies herein established should obtain sufficient fluidity and flexibility in the distribution of machine tools to make such reserves wholly unnecessary.
- 6. The WPB, Tools Division, will request all Departments and Agencies participating in this directive to review all lists of machine tools on order so that those not urgently needed may be cancelled. The Tools Division will keep itself posted as to all urgent and special demands.
- 7. All departments and agencies of the Government participating in this directive shall determine the location of machine tools within their cognizance which are available for transfer to fill other more urgent needs, and shall promptly advise the WPB.
- 8. The WPB, the Army and Navy Departments, and the Defense Plant Corporation, shall take such other immediate steps as are necessary to effectuate this directive.

#### Most of Machine Tool Job Seen Finished

• • • The machine tool industry already has completed the major portion of its job of re-tooling America for war, and before the year is over will be looking for more work to do, according to the National Machine Tool Builders Association in its publication "Machine Tools." Production figures have jumped from \$145,000,000 in 1938 to \$1,320,000,000 in 1942.

The war did not mean that machine tool manufacturers had to shift to a new product, and neither did they have to convert plants for production of machine tools for war, the Association said. Increased output was the new requirement. Machine tool builders did not have to alter the nature

of their manufacturing facilities for war production; they needed only to expand them.

Most of the nation's war plants are now fully equipped, and although demand for machine tools will remain heavy throughout the war, machine tool orders are showing a decline from the 1942 rate, the Association said. Since machine tool plant facilities consist chiefly of machine tools of the very types used for the manufacture of parts for guns, airplane engines and other war products, it would not be difficult to convert a portion of a machine tool plant to some other type of war work.

## Effect of 48-Hour Work Week Analyzed in

• • • Opinions on the effects of the 48-hour week order on the steel industry are widely varied and inconclusive at this writing. All agree that the move constitutes a financial strain and probably will result in concerted action to get relief on steel prices from OPA. Financial statements for 1942 bear out this need. Likewise, many agree that the 48-hour maneuver will not release many valuable workers for other industries and certainly will not increase steel production which is already at 100 per cent of capacity. Opinions vary widely on how great will be cost increases experienced from added overtime and how much of the industry can be put on 48-hours.

While current estimates point out a 30 per cent wage increase resulting from the added 8 hours of time-and-a-half, most steel industry workers will not benefit to this extent, either from lack of work in some finishing mills or because they have been working approximately 48 hours.

A roundup of current opinions in some key centers illustrates the wide range of thinking on the subject and clarifies a number of the misconceptions.

#### Wage Increase Figures Seen Erroneous

Pittsburgh

• • • Just as going over from a 48-hr. week to a 40-hr. week in the steel industry required more people to man the same operations, so will going from a 40-hr. week generally to a minimum 48-hr. week, require fewer workers. This opinion, which is held by all steel officials, is based upon the fact that steel operations are at a maximum level and little if any greater production can be obtained until new facilities come in.

If such a changeover were made during a normal period, the result would mean a laying-off of some workmen. However, under present war conditions, separations from the payroll are taking place for the most part in the flow of men going into the armed forces.

Some persons have interpreted the 48-hr. week as a "guaranteed amount work." However, in "economic czar" Byrnes' speech, made last week. he said, "many war industries are already working 48 hr. or more a week, but the order will compel other industries to go on a minimum 48-hr. week wherever feasible." It is clear to observers here that there are now some jobs in the steel industry where 48 hr. would not be "feasible." An example of this would be on a given steel product mill where the WPB has set up a definite quota of products to be made. If there was only enough work to require 35 hr. on the mill, in a given week, the workmen would be through at that time. Whether or not they could be shifted to other lines of work in order to fill out a 48 hr. week would depend entirely on whether such employment were available.

From an overall standpoint in the steel industry, output of both raw steel and finished steel products is at almost maximum levels. If this is being maintained with an average work week of 40 hr., it is obvious that the same number of employees now maintaining operations at maximum levels could not be boosted to a 48-hr. week, unless, of course, they were paid the straight and overtime for "standing around." This situation is probably the reason why there has been no wholesale rush to put regulations into effect before proper study has been made. The real value of a 48-hr, week will come when, as, and if more manpower is needed to maintain present maximum output because of men leaving for the armed forces.

The steel industry differs from many other industries in that they have a considerable portion of their operations in a category known as continuous or 24 hr. a day, 7 days a week. In such cases, like coke production, blast furnace operations, and open hearth operations, the paramount question is keeping the works going, regardless of how many men are used, or how many hours they work.

At the present time, most steel departments, such as blast furnace and open hearth have been giving men a 40-hr. week. A fundamental example would be an open hearth with four crews. These four crews, composed of various numbers of employees under 40-hr. week, would account for 160 of the 168 hr. per week per man. The extra 8 hours not covered by the normal crews are usually worked by what is known as the "knock-out crew." This latter crew usually consists of men who can perform many of the jobs around the open hearth, and they are available for such things as legitimate days off, absenteeism, etc.

If this same open hearth operation were to be changed so that the men were to work 48 hr. instead of 40, it could be handled by putting three crews consisting of various numbers of men, on the job, who would account for 144 hr. out of the necessary 168 hr. The deficiency between 144 hr.

DISCUSSING MANPOWER TABLES: To meet its manpower problems and replacement schedules, Carnegie-Illinois Steel Corp. interviews 20,000 applicants for jobs monthly, to provide replacements. Around 27,152 employees have shouldered the tools of war already.



110-THE IRON AGE, February 18, 1943

## Exclusive Reports from Key Centers . . .

and 168 hr. would be made up by increasing the number of men on the so-called knock-out crew. It is obvious that this same theoretical open hearth operation would need less men on a 48-hr. week than were used on a 40-hr. week, and unless losses because of the draft, etc., absorb the excess manpower, there would not be enough work for some employees on this particular operation.

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The same general situation would apply in other continuous operations, such as blast furnace, coke ovens, etc. In the case of finishing mills, which have enough work to keep crews going all week, the same general situation would apply, that is, less men would be required on the 48-hr. week than on the 40-hr. week. As a general rule, plate mills and others which have a maximum quota of products usually work 20 turns a week, which accounts for 160 hr. out of a possible 168 per week per man. Most mills are usually shut down one 8-hr. turn a week for two reasons-first, to make proper maintenance and repairs, and second, because finishing mill capacity is usually somewhat greater than steel making capacity. In the case of a theoretical plate mill, four crews under a a 40-hr. week would account for 160 hr., the maximum operating rate. Under a 48-hr. week, the mill might have to go to 18 turns instead of 20, using three crews and a floating crew to make the necessary fill-ins.

The minimum increase in wage cost per man per hour in the steel industry would probably amount to approximately 81/2 per cent. Other figures, running as high as 20 to 30 per cent, are statistically erroneous because they assume that the steel industry now working at maximum capacity would use the same number of employees to work at 48 hr. a week, as were used on a 40-hr. week. This, of course, is an optical illusion. Actual increased labor costs would probably be more than 81/2 per cent due to absenteeism and a reduction in output per man per hour because of going to a longer work week. The 81/2 per cent increase in labor cost is arrived at as follows:

Under a 40-hr. week with an aver-

age wage of one dollar, the average pay is \$40. On a 48-hr. week with an average pay of one dollar, the weekly pay becomes \$48 plus premium pay of \$4 making a total of \$52. By dividing 48 hr. into \$52 an average hourly rate of \$1.08½ is obtained. This new hourly rate is approximately 8½ per cent greater than the dollar an hour paid under a 40-hr, week.

• • • In addition to the articles on these pages interpreting the 48-hr. week action, Detroit's reaction is analyzed in the Assembly Line, page 78, while on the pages immediately following this, stories from Boston, Cleveland, Buffalo, New York and other important centers will be found.

#### Need for Steel Price Increase Debated

Washington

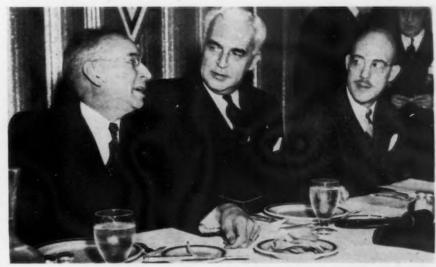
• • • • Application of the 48-hr. week executive order suddenly promulgated on Feb. 10, will have a profound effect on costs of steel. With an estimate that its application will mean \$104,000,000 a year increase in the wage bill, sources in the industry predict that this inevitable inflationary trend will drive OPA ceilings upward. At the same time, the order will not increase production, it is claimed, because the industry now is operating at ingot capacity. The order, how-

ever, would serve one of its primary purposes, if as estimated, it causes the dismissal of 100,000 men in the industry who can be shifted to and employed in labor shortage areas.

This latter point may be frustrated, however, for two reasons: (1) USW's opposition, and (2) the draft. It is pointed out that USW might strongly object to such a huge dismissal of steel workers and their shift to other areas where labor shortages exist, the depletion of individual plant unionrolls forming the objection. There is

48-HOUR WORK WEEK AREA MAY BE EXTENDED: Paul V. McNutt, (center), chairman of WMC, indicated in Chicago last week that the order for the 48-hour work week soon may be extended to other regions. Left is William Spencer, regional director, and at right is L. A. Appley, executive director of the agency.

Press Association



also the question of the adaptability of such labor to other lines of endeavor, whether in industrial or agricultural war work. Even more important would be the willingness of the laborers themselves regardless of union approval or disapproval of such a shift. Local Selective Service Boards may seize the opportunity of inducting many of the men so released, providing another reason for union opposition to the move.

While the order, as it now stands, technically covers only two steel areas, Baltimore and Buffalo, it is accepted as covering the entire industry in reality. This is so because the War Labor Board has consistently insisted on a uniform wage structure throughout the industry, and this has been a policy of the industry itself.

If the 48-hr. week is imposed by March 31, as the order requires, the "Little Steel" formula which provided for a 15 per cent increase in wages will be knocked into a cocked-hat. Wages will go up an additional 30 per cent. The reason is that the Fair Labor Standards Act requires payment of time-and-a-half for hours in excess of 40 a week. The steel industry is operating at a rate of 40.2 hr. a week, and now employs about 600,000 workers.

The additional wages will, due to time-and-a-half pay, amount to \$4 a week for each worker, or a total of \$2,000,000 a week on the basis of the employment of 500,000 workers. If the \$104,000,000 annual wage increase is demanded of the industry, it would mean that the total annual wages of more than \$300,000,000 will have been added to labor steel costs since the spring of 1941.

OPA officials, however, reflecting a complete reversal of policy under the new leadership of Administrator Prentiss M. Brown, showed no fear of the inflationary effect of the adoption of the 48-hr. week with its attendant overtime pay. Former Administrator Leon Henderson brought the house of organized labor down on him for opposing the steel wage increase last year. He took the position that any general wage increase would make it impossible to hold the price dam. In contrast the present OPA claims that the 48-hr. week will have a negligible inflationary effect, though admitting that it will add in the neighborhood of \$1,000,000,000 to the nation's wage bill. While conceding that a few price ceilings will be pierced, OPA economists say that in the case of the steel industry, they believe this is sufficient profit margin to absorb the increased overtime cost. They contend that in any event, any price increase in steel products would not effect consumer goods, but would be passed on to the government in higher prices for war goods.

Translated into taxes OPA's bearish approach discounts the inflationary effect of overtime pay by making the following argument: (1) The estimated one billion dollar increase would be only 2½ per cent of the total wage bill of 40-billion dollars; (2) The net addition to costs would be only 10 per cent, rather than 30 per cent.

OPA calculates on the basis of a general 46-hour week for all industries. Its 10 per cent increase wage cost is still built on a theory that with



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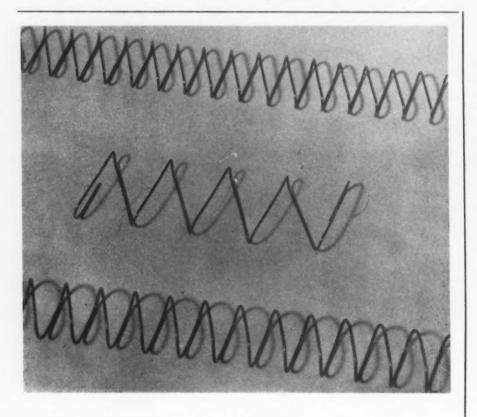
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wage t with respect to overtime, workers will be paid 8 hr. out of the 48 at a straight time rate representing 20 per cent of the total claimed increase of 30 per cent. It is only the additional half-time payment for the last eight hr., OPA contends, that represents additional costs. This would amount to only 10 per cent.

It is not universally accepted that the 48-hour week will mean a reduction in the number of employees. Some express concern that steel companies will have to pay for 48 hr. of work while getting only the present 40 hr. of work.

The reaction of CIO was reflected by the suggestion of CIO Research Director Harold Ruttenberg that rerolling mills which were saved from shut-down through the grant of a 40hr. week operation be stepped up to a 48-hr. week turn. The WPB Steel Division at the expense of integrated companies ordered the continued operation of re-rolling mills.



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Production speeds possible by former methods of winding about a mandrel were insufficient for present war-time needs. The coiling of rectangular springs by Torrington's method easily keeps pace with today's war production.



# 48-Hr. Week Not Seen Effective in Steel; Price Rise Talked

New York

\*\* The steel industry here flatly stated last week that the 48-hr. week pronouncement will not have much effect on it unless further clarifying announcements change the whole trend. At the same time there is talk of possible concerted action to gain price relief for steel. Financial statements for 1942 definitely back-up this need for a greater profit margin.

Steel spokesmen here while stalling for time as the steel industry generally has not actually been included in the 48-hr. ruling, stated that very little changeover could be made as all prime war production departments are now working aproximately 48-hr. weekly and the less essential operations, such as tin plate departments which are working on reduced permissible quotas, cannot be placed on a 48-hr, week for three crews. From 30 to 40 per cent of the industry is said to be working the full 48-hr. week and it is believed this ratio cannot be changed appreciably. Thus the purpose of the ruling, to spread manpower at the same production level, would not show any appreciable result in the industry.

That a plea for price relief on steel is forthcoming has been pointed out by observers here as the only possible result of the present squeeze between operating costs and net income. The added burden of the 48-hr. week overtime which is already prevalent, plus the rising costs of coal and coke and other related operating cost factors are draining the coffers of the steel companies. This fact has been amply shown in the net income reports of the last four quarters. If, in addition to this circumstance, the "Little Steel" formula is broken by the CIO, no other answer but higher steel prices seems likely. Likewise, if John L. Lewis is permitted to horse through his ambitions of \$2 per day more for his miners, the situation worsens.

Hopes for spreading the manpower in the steel industry by adopting a 48-hr. schedule for all departments seem doomed to disappointment. In order to put tin plate mills, for instance, on the full schedule, it would mean transferring all except one shift of workers and utilizing the one shift for full 48 hr. per week. This plan would not only make mill operations decidedly inefficient but would release men whose experience is not good for



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Milwaukee MACHINE TOOLS

any other department and who after being accustomed to the high wages of the tin mills are exceedingly reluctant to accept other work at the wage rates paid in other departments and industries.

Opinions solicited with regard to the probable actions of CIO's Murray on steel wages and UMW's John L. Lewis acting for the miners, were met with a hands-in-the-air attitude. All agree that the miners' negotiations should begin at once and bets are even that accord could not be reached by March 31 even with this lead. In the event of a coal strike both coal and coke shortages would be experienced quickly at the present rate of steel production as stockpiles are not thought to be generally in excess of 39 days and UMW members control the beehive coke supply as well as coal supplies. The general stand of the government indicates a finish fight for the "Little Steel" formula but no hint has been given on how accord could be reached if the unions stick to their demands.



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# 48-Hour Week Seen As Public Gesture

### Cleveland

. . While it may have been considered that there was a need for the stimulant of a Presidential edict to get the work-week in war industries boosted up to 48 hr. it is extremely difficult to point out specific war plants in this area not working at least 48 hr. a week and all but a very few have been on such a work schedule for many months. Such an order, when analyzed, seems to be for effect on the general public rather than on industry itself. Manpower shortages have been one of the most talked of problems in war production and the executive order appears to show the public that something concrete is being done.

A good example of work week schedules can be drawn from the machine tool industry, one of the area's, if not the country's, busiest industries. When orders began piling in, three years ago, builders took steps to immediately overcome their manpower problems. A work week that was from an industry standpoint close to 40 hr. was steadily pushed up. Instead of inaugurating a threeshift day, where supervisory controls would be spread too thin to be effective, the work day was pushed up to 10, 11, and even 12 hr., but the plants continued on a two-shift basis. The work week steadily became longer throughout the industry until at the present time it averages, industrywide, 53.4 hr.

### 48-Hr. Week Seen as Aid in Buffalo Area

• • • Putting a mandatory 48-hr. week into effect in the Buffalo industrial area is expected to be of tremendous benefit to the three big steel producers and nearly all foundries.

While plant spokesmen are reluctant to discuss figures at this early stage, it is reported unofficially that about 60 per cent of all production workers at Bethlehem, Republic and Wickwire are working a six-day 48-hr. week while the other 40 per cent are working a five-day week.

In the case of Bethlehem, the chief ingot producer, a plantwide 48-hr. week would be equivalent to gaining 1000 new employees, it is estimated, or roughly 50,000-man-hours, assuming the change would not result in any increase in "absenteeism."

The 48-hr. schedule will be a boon to foundries, most of which are work-



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INEXPERIENCED machine tool operators get the extra help they need with Apex Safety Friction Tapping Chucks. In the first place the hazard of overloading and breaking tools is practically eliminated. Taps work safely, accurately, at top speeds on thru or bottom holes.

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ing a 40-hr. week. Foundries have lost many of their able-bodied workers to the less arduous plane industry and so far have failed in their strenuous attempts to induce them to return to the fold.

Hundreds of employees in downtown stores, coasting along on a 40 to 44-hr. week are likely to be driven into the shorthanded war industries.

While no official word is forthcoming from the big steel and metal trade employers on their plans to meet the 48-hr. order, spokesmen for the com-

panies, as well as the labor unions, have agreed the new schedule is "satisfactory."

Airplane plants will benefit little from the 48-hr. schedule. They have been operating on a minimum schedule of six-days a week and in many departments seven days since long before Pearl Harbor. However, despite their essentiality, the two big plane producers have been losing hundreds of men through the draft, and the revamping of hours may give them a chance to obtain more replacements.

### Massachusetts Doubts Benefit of 48-Hr. Week

Boston

• • • • According to some Massachusetts industries the WMC aim to free more workers for war production through establishment of a 48-hr. working week is one thing, but the workability of it is another thing, because Massachusetts labor laws will have to be taken into consideration regardless of Washington's attitude.

To allow even a 30-min. lunch period in an eight-hour day reduces the work week to 45 hr. Shipyards give workers 20 minutes for lunch within the eight hours and pay them for the lunch time. Boys 16 years old working in shipyards under supervision of men have longer lunch periods and as a result work schedules are upset.

Women employees may complicate the 48-hr. work week situation. The state law provides they have a three-quarter hour lunch period, as well as boys 16 to 18 years old. The state law prohibits women working after 10 p.m. and before 6 a.m.

Massachusetts war industries generally work on a 48-hr. week basis, but civilian goods industries do not. In a recent survey of work hours it developed war work industries male employees worked an average of 50.1 hr. a week. Women worked only 42.1 hr., but the overall of men and women average was 48-hr. a week.

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Heavy metals and machine tool industries generally worked at or close to 48 hr., but the shoe industry was down to 36.5, men's clothing 35.7, women's clothing 35.7, cotton 41.2, and woolens 40.5 hr. a week. State labor officials doubt that the 48 hr. week will squeeze out labor from consumers' goods industries for the short handed war plants. Then, too, it is pointed out that all industries mentioned are essentially engaged on war work.

### Canada's Plane Output 7000 Units Since Start of War

Toronto

• • • Canada's aircraft industry, since the outbreak of war, has built and delivered approximately 7000 airplanes of which 1200 have been sent to the various United Nation fighting fronts, the remainder for training purposes in Canada, Ralph P. Bell, director of aircraft production, reported.

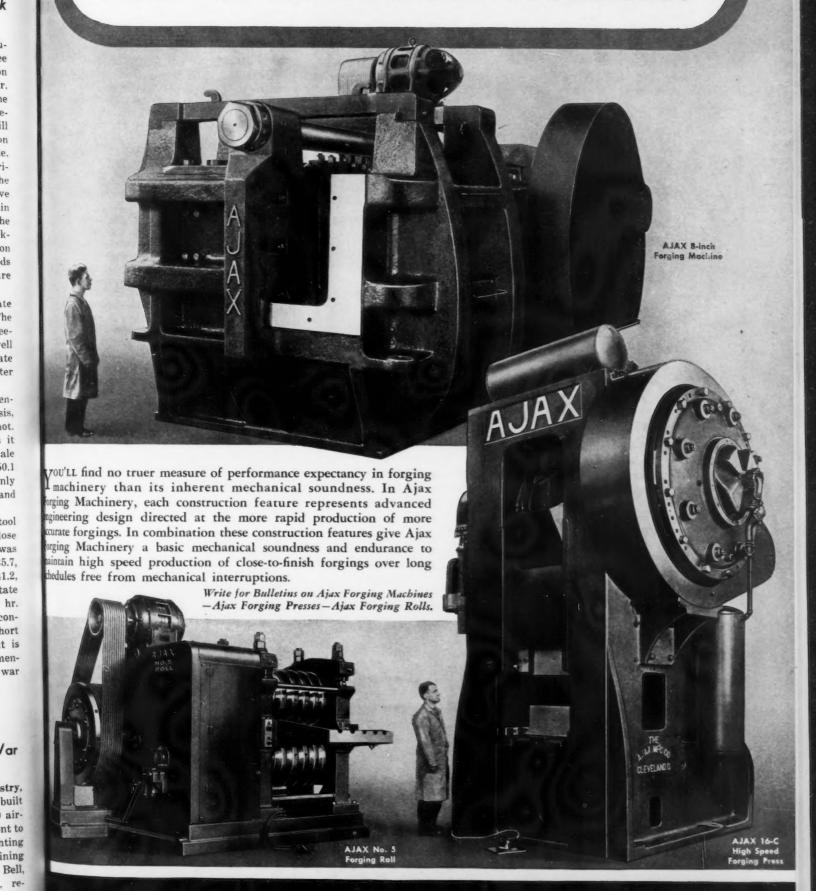
### PLANATHREADING

Shells to fire at the Axis are made of tough, heat treated steel. Here is a large one having a Planathreading job done on the base. The two internal threads are milled simultaneously.



HALL PLANETARY CO.

## BUY FORGING EQUIPMENT ON BASIS OF MECHANICAL SOUNDNESS



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MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO 621 MARQUETTE BUILDING . CHICAGO, ILLINOIS



... there is no discharge in the war"

(apologies to Rudyard Kipling)

FORD CHAIN BLOCKS, whether TRIBLOCS, SCREW HOISTS OF DIFFER-ENTIAL HOISTS are rapidly, efficiently, and economically keeping their war loads "going up and down again." FORD CHAIN BLOCKS are sturdy mechanical soldiers in this war for freedom against tyranny—and as such deserve the consideration given all soldiers. They should not be overtaxed; they should not be weakened by overload; they should have a regular "ration" of lubricant. Here are five ways to make your FORD CHAIN BLOCKS last longer and do better work.

- The gear cover should be removed occasionally and a small quantity of heavy graphite grease applied to gear train.
- The load chain should be cleaned and lubricated frequently with a heavy oil, particularly at engaging points of links.
- · Load sheaves should also be greased.
- Oil the bearings frequently so that no bearing will run dry and cause excessive wear.
- Oil holes are provided in the TRIBLOC at vital points. These should be used frequently.

When given intelligent care, thoroughly cleaned and lubricated at intervals, FORD TRIBLOCS will remain efficient under the hardest usage for a long time. Your FORD HOIST can be one of your best friends during this production emergency. Take care of it.



Order from Your Distributor

### FORD CHAIN BLOCK DIVISION

Philadelphia, Chicago, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

# **Briefly Told—**

- A crew of 58 technicians who repaired propulsion equipment on the battleships California and West Virginia, damaged at Pearl Harbor, has received the Army "E". The award, which is usually given to plants in this case went to a unit of General Electric men who had worked in three shifts, 7 days a week, in the ships' holds, breathing air pumped from above decks.
- Twenty-four employees of Westinginghouse Electric & Mfg. Co. have been awarded a total of \$6174 for outstanding suggestions in 1942. Their ideas were among 2746 adopted during the year. Joseph Watson, 32-year-old production clerk, received \$1208.50 for discovering a way to speed production of parts for Navy circuit breakers.
- Structural steel will resume its fomer role in industrial building just as soon as material shortages permit, Harold K. Ferguson, president of the H. K. Ferguson Co., industrial engineers and builders of Cleveland and and New York, predicted recently.

"We likely will use steel in just about the same ratio as we did in the days before the war," he said.

• War workers' production ideas saved 1,250,000 man-hours and much material in General Electric plants during 1942, according to a statement by the company, announcing that a record \$158,943 was paid last year for 16,204 suggestions adopted of 53,945 submitted.

Two workers, Jerry Buccuzzo of Lynn, Mass., and Joseph Mizak of Bridgeport, Conn., received single awards of \$1200 each, equaling an individual mark set in 1926. Buccuzzo suggested a means of reducing the warm-up time in the testing of airplane superchargers, vital to high altitude flying. Mizak suggested a way of turning out certain marine parts in a single operation in place of the previous drilling, end milling and hand finishing.

• Contracts approximating \$185,000 for the conversion of 100 railroad box cars for the transportation of fuel oil and petroleum products to the Eastern seaboard states have been authorized by the Defense Plant Corp., and will be sponsored by the Office of Defense Transportation. After converversion, an average box car with a

# Ship Repairers, Other War Workers Honored; New Industrial Notes

load capacity of 40 tons will be equipped to transport 10,000 gal. of fuel oil or other vital petroleum products.

- Static electricity experiments have demonstrated that rubber tires impregnated with conductive materials drain static charges from trucks used in explosives plants, reducing the danger from sparks that might cause an explosion, according to Dr. Victor Wouk, 23-year-old Westinghouse research engineer, at the A.I.E.E. winter convention.
- A program which lists sizes, construction, grades and breaking strengths of the vast majority of tonnage of wire rope, was developed by engineers of the wire rope industry to serve as a wartime conservation measure and as a guide for postwar practice. According to the Division of Simplified Practice, National Bureau of Standards, the Simplified Practice Recommendation for Wire Rope will be effective from Feb. 15, 1943 and identified as "R198-43."
- The extent to which small and aften idle companies may be made to fit into a large industrial pattern for the production of critical items is indicated in the achievements, through sub-contracting, of two industries, the WPB announced. American Type Founders, Elizabeth, N. J., has subcontracted to a total of 46 companies in carrying out a contract for the production of approximately 10,000 aircraft starters per month. Elastic Stop Nut Co., Union, N. J., now has a total of 92 sub-contractors, who make it possible to raise the production of aircraft stop nuts to a monthly capacity of approximately 120 million nuts per month from a mere 5 million back in 1939.

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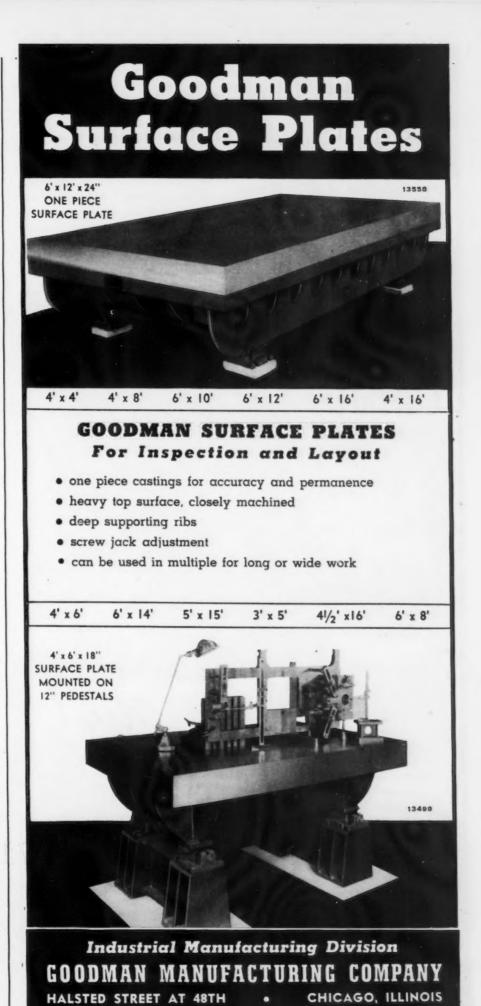
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• Regent Finishers, New York, achieved a record in war production by plating and finishing nearly 1,000,000 articles in a recent single month. The plant employs only 20 trained technical workers and 20 women helpers. The company plates within tolerances as close as 2-10,000 in, and uses a variety of metals in the plating and finishing process including copper, brass, steel, nickel and aluminum.



# 100 War Contractors Revealed Holding 70% of Dollar Contracts

• • • • One hundred war contractors held 70 per cent of the dollar volume of prime contracts, or \$59,557,900,000, as of the end of November, 1942. This is shown in an OWI analysis of individual supply contracts of \$50,000 or over held by 100 corporations to whom the largest volume of contracts has been awarded.

As of the end of June, 1942, the top 100 companies held 71 per cent of the dollar volume of these contracts. Earlier studies based on Army, Navy and Maritime Commission contract awards only showed that at the end of February, 1942, the top 100 concerns held 76 per cent of the dollar

volume, and at the end of September, 1941, 83 per cent.

The awards are for airplanes and parts, naval and merchant ships, guns, ammunition and other munitions items. The figures cover the war contracts reported as awarded by the Army, Navy and Maritime Commission since June, 1940, and by foreign purchasing missions since September, 1939. The defense aid awards of the Treasury are included.

Twelve of the top 100 corporations in November were not among the leading 100 in June. Of the total value of supply contracts reported as awarded between the two periods, 70 per cent went to the 100 corporations in the November listing and 66 per cent went to the 100 corporations in the June tabulation.

The distribution of war work is widened by the extent to which these companies subcontract jobs to other manufacturers. However, a considerable portion of subcontracts awarded by all other prime contractors goes to the 100 corporations.

The following table shows the distribution of supply contracts held:

				fanice	of T	Cont otal ards
*Volume of C	ontra		June, 1942	Nov., 1942	June, 1942	Nov., 1942
\$1,000,000,000	and	over	8	16	31	42
600,000,000	**	4.6	17	25	44	50
400,000,000	**	**	22	35	49	56
200,000,000	**	**	42	58	59	63
100,000,000	**	**	76	100	68	70
70,800,000	**	**	100	†	71	†

\*Includes the total dollar volume of individual prime contracts of \$50,000 or over held by the companies.

†Not available.

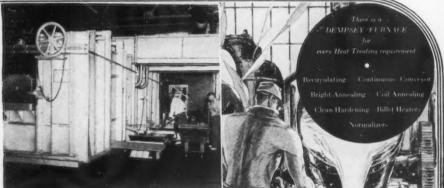
### Feb. 21 Set for Conference On Pittsburgh Steel Output

Pittsburgh

• • • In the first of a series of such district conferences, the United Steelworkers of America has called a meeting in the Greater Pittsburgh area for Sunday, Feb. 21, to discuss possibilities for increasing steel production through a better utilization of the employee-management production drive committees. Representatives of the steel locals of this area along with management representatives have been invited to participate.

Last week Philip Murray, CIO head, put his organization behind the effort to reduce absenteeism in industry. It is expected that his organization will soon formulate a more definite plan of attack on this problem than is now being done in union papers.

# DEMPSEY industrial furnaces



Pouring from one of five aluminum melling furnaces at the Cincinnati plant of Wright Aeronautical Corporation

Tomorrow is Important
We point with pride to the fact
Tomorrow were serviced by the print with pride to the fact
Tomorrow is Tomorrow
Tomo

Even in the stress of today's unprecedented war production schedules, wise management must think of tomorrow! In the selection of heat treating equipment, Dempsey Furnaces are the obvious choice. They are engineered to deliver maximum performance at lowest cost, high efficiency and trouble-free operation. Rugged, sturdy construction insures years of service during and long after the war.

WRITE FOR BULLETINS

Continuous pusher type hardening furnace, automatic quench, and continuous belt conveyor type draw furnace.



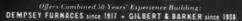




Carburizing, annealing and general heat-treating oven furnaces.

Pot furnace for heat treatment

DEMPSEY INDUSTRIAL FURNACE CORPORATION
SPRINGFIELD, MASSACHUSETTS



# Effect of Strike Now Being Felt in Canada

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• • • Some branches of the Canadian war industry now are beginning to feel the effect of the strikes that recently hit Algoma Steel Corp. Ltd., and Dominion Steel & Coal Corp. Ltd., cutting iron and steel production to less than 50 per cent for a period of two weeks.

Officials of Cockshutt Plow Co., Brantford, Ont., state the steel department closed Feb. 10, because of lack of steel, and will remain closed until Canadian steel mills again reach full production. Canadian steel mills again are running close to the capacity mark, approximately 96 per cent, while blast furnaces are on a 100 per cent basis.

Canadian war industry has reached the stage where maximum capacity could be attained providing steel and other raw materials were available. The closing of the big steel mills at

IT'S ALL DONE WITH MIRRORS: A system of mirrors devised at the Westinghouse research laboratories enables workmen to measure at a glance the width of yellow-hot slabs too high for customary long-hand gaging. The experiment developed by Dr. E. D. Wilson, research engineer, superimposes images of the steel plate onto a lined chart, showing the plate's width at a glance.



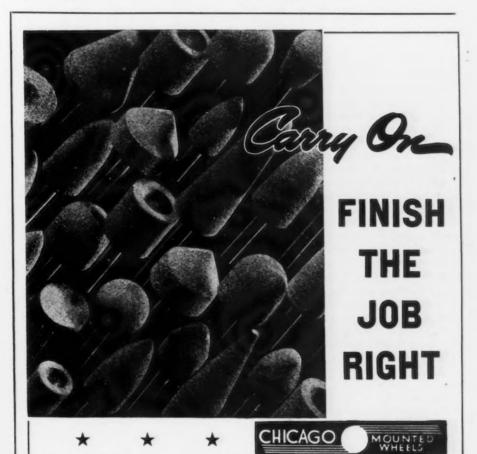
Sault Ste. Marie and Sydney resulted in a loss of approximately 150,000 tons of steel to the country's war effort, a loss that cannot be made up, and it is stated that this shortage may put off for several weeks the maximum production by war plants.

Plans are under consideration in Government circles for some revamping of the Canadian shipbuilding program. In this connection it is stated that, in addition to building war and cargo vessels.

### U. S. Steel Shipments 1,685,993 Tons in January

Pittsburgh

• • • Shipments of finished steel products by subsidiary companies of United States Steel Corp. for January were 1,685,993 net tons, the second highest January figure in the history of the corporation. This compares with 1,849,635 net tons for December and with 1,738,893 net tons in January, 1942.



Like setting the last rivet as the plane comes off the production line—burring, finishing and polishing to minute specifications mean the job is right.

Expert design, best quality materials, skilled workmanship—these are not enough without that all-important finish.

There is a "just right" Chicago Mounted Wheel for every polishing, grinding and burring operation, backed by the long-life guarantee that has made Chicago Mounted Wheels famous since their introduction 45 years ago.

PROMPT DELIVERIES—Count on us to help you break bottlenecks due to slow grinding wheel deliveries. We're working 24 hours a day, every day, and due to our central location, can make prompt shipment on all Mounted Points and Grinding Wheels 3" in diameter and under. With the approval and endorsement of WPB, all our facilities are concentrated on these smaller sizes, enabling us to give the most potent service to the war program.

Send Catalog Coupon for your copy showing in actual colors and sizes the largest line of Mounted Wheels made.

CHICAGO WHEEL & MFG. CO.

America's Headquarters for Mounted Wheels 1101 W. Monroe St., Dept. RA, Chicago, III. Canadian Trade Corp., Ltd., 1332 Williams St., Montreal

Please	send	copy of	your new	RA- oatalog.
Name				
Addres	ıs			

# CMP Procedure for Obtaining Maintenance,

• • • Regulation No. 5, controlling purchases of maintenance, repair and operating supplies, establishes required procedures for obtaining both controlled and non-controlled materials. It was issued Feb. 9.

Persons engaged in the manufacture of products or in the business activities listed in Schedules I and II of the regulation are permitted to obtain necessary controlled materials, other than aluminum, by the use of a specified form of certification. Such persons may obtain aluminum required for essential maintenance, repair and operation from a producer or an approved aluminum warehouse in amounts not to exceed 100 lb. from all sources in any one calendar quarter, by endorsing a designated certification on their purchase orders.

Regulation No. 5 assigns a preference rating of AA-1 to deliveries of all materials needed for maintenance, repair and operation by persons covered by Schedule I and of AA-2X to those covered by Schedule II.

All other businesses are authorized to make use of an A-10 rating in purchasing non-controlled materials for maintenance, repair and operation.

Use of any of these ratings must be accompanied by a prescribed certification.

Acquisition of materials for maintenance, repair and operation under the regulation is restricted to the amounts obtained during a specified base period.

The preference ratings assigned by Regulation No. 5 supersede those assigned by orders in the "P" series for maintenance, repair and operating supplies, in the case of materials or products to be delivered after March 31. All "P" orders, however, are specifically continued in existence and all restrictions and requirements contained in them remain in full force.

Selected paragraphs from the new regulation follow:

(c) Controlled materials. (1) Subject to the quantity restrictions contained in paragraph (f) of this regulation, any person engaged in the business of producing any product or conducting any business listed in Schedule I or II, requiring delivery after March 31, 1943, of any controlled material, except aluminum, for maintenance, repair or operating supplies

in the conduct of such business, may obtain the same by placing on his delivery order substantially the following certification, signed manually or

# New Form Issued for Aluminum for Alloying

• • • Firms requiring aluminum for alloying, deoxidizing, chemical and similar purposes will be permitted to cut across the allocation flow of CMP. They can apply direct to the Aluminum and Magnesium Division of WPB on Form CMP-13, and obtain their allotments direct. The change in procedure was announced Feb. 10.

The new form must be filed in triplicate by Feb. 25. Copies may be obtained from field offices of WPB. The form will be used instead of CMP-4A or CMP-4B.

as provided in Priorities Regulation

CMP allotment symbol MRO—(P order No. —) —The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the controlled materials covered by this order are required for essential maintenance, repair or operating supplies, to be used for a purpose listed in Schedule I or Schedule II of CMP Regulation No. 5 and that delivery thereof will not result in a violation of the quantity restrictions contained in paragraph (f) of said regulation.

When the person making such certification is covered by any order in the "P" series he shall also show, in the space indicated, the number of such "P" order.

An order bearing such certification shall be deemed an authorized controlled material order and shall have the same status as an order bearing an allotment number under all applicable CMP Regulations, unless otherwise expressly provided.

(2) Any person engaged in the business of producing any product or conducting any business listed in Schedule I or II requiring aluminum in any of the forms or shapes constituting a controlled material, for essential maintenance, repair or operating supplies, may obtain the same from a controlled materials producer or from an approved aluminum warehouse, in

amounts not to exceed 100 lb. from all sources during any one calendar quarter, provided, that any order placed pursuant to this paragraph (c) (2) shall be accompanied by a certificate in substantially the following form, signed manually, or as provided in Priorities Regulation No. 7:

The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the materials covered by this order are required for essential maintenance, repair or operating supplies, to be used for a purpose listed in Schedule I or II of CMP Regulation No. 5; that the use of other materials for such purpose is impracticable; and that the amount of aluminum covered by this order, together with all other amounts received by, or on order for delivery to the undersigned, from all sources, for such purposes during the same quarter, will not exceed 100 pounds.

Any producer or warehouse receiving an order bearing such certificate shall be entitled to rely thereon and may fill the order, unless he knows or has reason to believe the certificate to be false.

- (d) Preference ratings for maintenance, repair and operating supplies.
  (1) Subject to the quantity restrictions contained in paragraph (f) of this regulation, orders calling for delivery after March 31, 1943, of maintenance, repair or operating supplies other than controlled materials (regardless of whether such supplies be Class A products, Class B products, or other products or materials) are hereby assigned preference ratings as follows:
- (i) AA-1 for maintenance or repair of facilities required for producing any product or conducting any business listed in Schedule I or for necessary operating supplies for such production or business;
- (ii) AA-2X for maintenance or repair of facilities required for producing any product or conducting any business listed in Schedule II or for necessary operating supplies for such production or business; and
- (iii) A-10 for necessary maintenance or repair of facilities required for producing any product or conducting any business not listed in Schedule I or Schedule II or for necessary operating supplies for any such purpose.
- (2) A preference rating assigned under this paragraph (d) shall be applied only by use of the following certification (in lieu of the endorsement

# Repair and Operating Supplies Explained CMP

specified in Priorities Regulation No. 3), signed manually or as provided in Priorities Regulation No. 7:

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ule I erate. igned e apg cerPreference rating . . . . . (specifying rating) —MRO. The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the items covered by this order are required for essential maintenance, repair or operating supplies; that this order is rated and placed in compliance with CMP Regulation No. 5; and that the delivery requested will not result in a violation of the quantity restrictions contained in paragraph (f) of said regulation.

(3) A person with whom a delivery order is placed bearing a preference rating assigned by this regulation may extend the rating only in the manner provided in Priorities Regulation No. 3 (using the endorsement therein specified) and subject to the limitations contained therein and in CMP Regulation No. 2.

(e) Plants engaged in several activities. If a single plant or operating unit is engaged in several activities which are not all listed on the same schedule (or if some are so listed and others are unlisted), and it is impracticable to apportion requirements for maintenance, repair and operating supplies between such activities, the principal activity alone shall be considered for purposes of determining whether controlled materials may be obtained under paragraph (c) of this regulation and also for determining which preference ratings may be applied under paragraph (d).

(j) Additional assistance in individual cases. Any person requiring repair, maintenance or operating supplies who is unable to obtain them in line with the provisions of this regulation may apply to WPB for additional assistance. If no particular form is specified by applicable orders, applications may be made on Form PD-1A or in the case of a PRP unit, on Form PD-25F. Such application may be filed with appropriate industry division, or if the amount involved is less than \$500, with the regional office of the

### LIST A

The following items are excluded from the definition of "operating supplies" in paragraph (b) (2) of CMP Regulation No. 5, regardless of whether normally carried as such according to established accounting practice:

1. Fabricated containers (in knockdown or set-up forms, whether assembled or unassembled), required for packaging products to be shipped or delivered.

2. Printed matter and stationery.

3. Paper, paperboard, and products

manufactured therefrom; molded pulp

manufactured therefrom; molded pulp products.

4. Fuel or electric power.

5. Office machinery or office equipment.

6. Clothing, shoes or other wearing apparel, if made of leather or textiles, except that the following types may be included in operating supplies when specially designed and used to furnish protection against specific occupational hazards (other than weather):

a. Asbestos clothing.

b. Safety clothing impregnated or

### Authorizations for Class B Firms Beain

• • • Advance authorizations, which may be used by manufacturers of Class B products to obtain steel, copper and aluminum for delivery during April under CMP, were announced Feb. 12 by WPB.

Authorizations are in the form of a letter sent direct to

those manufacturers who have

already made CMP applications.
Companies whose CMP-4B applications are now on file with
WPB are being assigned allotment numbers to enable them to obtain during April up to 30 per cent of the controlled materials for which they have applied for the entire second quarter. Preference ratings are also assigned so that manufacturers may obtain up to 30 per cent of their stated requirements of other materials.

coated for the purpose of making the same resistant against fire, acids, other chemicals or abrasives. c. Safety industrial rubber gloves and hoods and linemen's rubber gloves and

d. Gauntlet type welders' leather gloves and mittens, and electricians' leather protector or cover gloves.

e. Other safety leather gloves or mittens, but only if steel stitched or steel reinforced.
f. Safety industrial leather clothing other than gloves or mittens.
g. Metal mesh gloves, aprons and sleeves.

sleeves.
h. Plastic and fibre safety helmets.

### SCHEDULE I-PREFERENCE RATING AA-1 Manufacture of the following:

Unfabricated and semi-fabricated prod-

Aluminum and aluminum alloy semi-finished products.

Copper and copper alloy semi-finished

Copper and copper alloy semi-finished products.
Ferro-alloys.
Iron unfabricated and semi-fabricated products, including: forgings, pig fron, pipe, wire, wrought iron and foundry products.
Magnesium and magnesium alloy semi-fabricated products.
Non-ferrous metal unfabricated and semi-fabricated products.
Steel unfabricated and semi-fabricated products, including: bars, forgings, pipe, rolling mill and foundry products, sheets, strips, structural steel, tubing, and railroad rails, frogs, switches and crossings.

### Iron and steel finished products:

Aircraft landing mats. Boiler-shop products, including: boil-

ers, gas cylinders, steam condensers and tanks.

Bolts. Cooking ranges and stoves, except elec-

COOKING FAIRSON COOKING FAIRSO Metal barrels, drums, kegs and shipping pails.
Nuts.
Rivets.
Saws.
Screws.
Steel springs.
Stove pipe.
Thermostats and other temperature control devices.

control devices.
Transportation-equipment hardware.
Washers.

Water heaters, tanks and boilers.

Acids.
Alcohols.
Alkalies.
Basic chemicals and intermediates.
Coal tar and coal tar derivatives.
Compressed and liquid gases.
Dyes, colors, and pigments.
Fats and oils (industrial only).
Lacquere. Lacquers. Organic and inorganic chemicals. Plastics and synthetic resins. Soap. Solvents. Varnishes.

### Industrial machinery and equipment:

Industrial machinery and equipment:

Chemical manufacturing machinery and equipment.

Compressors.

Conveying machinery and equipment.

Cranes, derricks, hoists and winches.

Electric furnaces.

Electrical industrial equipment.

Excavating machinery.

Fans and blowers (industrial).

Food-dehydration machinery.

Furnaces and ovens (industrial).

Gas generating equipment and apparatus.

Gas generating equipment and apparatus.

Heat exchangers.
Industrial lubricating equipment.
Industrial machine-shop products.
Industrial trucks and tractors.
Instruments (industrial).
Machine tools and metal-working machinery, including: bending, forging, cutting, shearing, rolling, milling and pressing machinery.

Mechanical power-transmission equipment.

Mechanical power-transmission equipment.

Mining machinery and equipment.
Ore milling, smelting and refining equipment.
Petroleum refining equipment.
Plastic working machinery.
Pumps.
Rubber-working machinery.
Stone, clay, and glass products manufacturing machinery.
Vacuum pumps.
Welding equipment, gas and electric, including welding rods and electrodes.
Well-drilling machinery.
Woodworking machinery (except cooperage and wooden box making machinery).

### Direct-military products:

Direct-military products:

Aircraft, propellers, engines and parts. Ammunition.

Ammunition boxes and chests.

Combat vehicles.

Explosives.

Ordnance.

Pyrotechnics.

Ships, equipment and parts, including vessels of all types.

Tanks, engines and parts (combat).

Electrical products:

Electrical carbon and graphite products.

Electric motors and generators. Electric instruments. Floodlights. Fuses.
Insulated wire and cable.
Motor-generator sets.
Physical-therapy equipment.
Pole-line hardware a id insulators.
Searchlights.
Spotlights.
Storage batteries.
Switchgear. Switchgear. Transformers. Wiring devices and conduits. X-ray equipment.

### Engines and turbines:

Diesel engines. Gasoline engines.

Hydro turbines. Steam engines and turbines.

### Communication equipment:

Communication equipment, including telephone and telegraph systems and apparatus.

Fire alarm systems.
Phonographs.
Radio and radar equipment and tubes.
Railroad signals and accessories.

### Transportation equipment:

Bicycles and parts: Locomotives, diesel, electric and steam. Motorcycles, side cars and parts. Railroad and street cars. Abrasive wheels, stones, papers and

Abrasive cloths.

Agricultural machinery, implements and equipment.

Air conditioning and commercial refrigeration equipment (mechanical).

Closures (pressed paper and molded plastic). Elevators.

Elevators.
Escalators.
Fishing equipment (commercial).
Glass containers.
Jewel bearings.
Laundry equipment (domestic).
Motor vehicles, engines and parts (commercial).
Navigation instruments.
Optical instruments and lenses.
Photographic apparatus.
Professional, scientific and engineering instruments and appliances.
Refractories.

Refractories.
Refrigerators (mechanical).
Rubber and rubber products (natural and synthetic).
Safety equipment, including helmets, goggles and Civilian defense items.
Stokers.
Tires and tubes.
Tractors.
Valves, faucets and fittings.
Wooden, paper and fiber containers,

### Persons engaged in the following industries:

Analytical, research, testing, and control laboratories.

Discovery, production, transportation, refining and marketing of natural gas, petroleum and petroleum products.

Electroplating, galvanizing and other metal coating.

Electroplating, galvanizing and other metal coating.

Gas, light, power, water, central heating, and sanitary services.
Industrial food production, processing, packaging, preservation and storage.

Mining and quarrying.

Public transportation and terminal facilities including stevedoring.

Ship repair and maintenance.

Smelting.

Wire communications industry.

### SCHEDULE II-PREFERENCE RATING

### Manufacture of the following:

Iron and steel finished products: Boilers and radiators (heating).

Fabricated iron and steel wire prod-

ucts.
Gas conversion burners.
Hardware except transportation-equip-

ent hardware. Kitchen and household cans and pails.

Lawn mowers.

Metal bottle caps and closures, except verage crowns. Metal bottle caps and closures, excep-beverage crowns.
Metal cans.
Metal doors, window sash, frames, molding and trim.
Metal furniture.
Metal sanitary ware.
Milk cans (bulk).

Milk cans (bulk)

Milk cans (bulk).
Razors.
Screens and weatherstripping.
Steam tables and restaurant equipment.
Tools, farm and garden.
Vitreous enameled products.

### Non-ferrous metal products:

Clocks. Collapsible tubes. Insignia.

Pins, needles, hooks, eyes, snaps, buckles and fasteners.

Time stamps and recording machines.

Watches

### Non-metallic products:

Lumber, logs, ply-wood and veneer. Non-metallic sanitary ware. Textiles, clothing and leather goods.

### Industrial machinery and equipment:

Business machines,
Construction material,
Cooperage and box-making machinery,
Food processing machinery and equipment, except dehydration equipment,
Laundry and dry-cleaning equipment.
Leather working machinery,
Metal container making machinery,
Printing machinery,
Pulp and paper machinery,
Scales.



### REDUCE MACHINING TIME WITH KENNAMETA

Limited supplies of men and machines demand that man hours on production jobs be held to the minimum.

Production efficiency cannot be defined by total output; the number of machines and men, obviously, must be considered.

The most efficient lathe tool, then, is the tool that enables the operator to produce the most finished products from his machine in the least time

KENNAMETAL has been accepted by the steel machining industry on this basis. KENNAMETAL will cut more steel in less time . . . use KENNA-METAL on your boring, turning, and facing oper-ations for increased production with no increase in man hours.

Write for the new KENNAMETAL TOOL MANUAL for complete information about this superior steel cutting carbide.



Style No. II



Style No. 12

\*INVENTED AND MANUFACTURED IN U. S. A.





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WITNESS BEFORE TRUMAN COM-MITTEE: Clifford E. McEvoy, president of the Clifford E. McEvoy Shipbuilding Corp., Savannah, Ga., wipes his perspiring brow when questioned by the Truman Committee investigating the war. Evidence was brought forth that the Federal government has spent \$7,000,000 on a barge construction program on which it has yet to receive delivery of a single barge. McEvoy disputed a suggestion by committee counsel that his corporation has no assets except the government contracts, on which it stands to make a profit of \$1,250,000 on 23 barges.

Spraying equipment (industrial). Textile machinery, Water treatment equipment.

### Electrical products:

Dry cell batteries. Electric bulbs and tubes. Electric ranges. Electric sound signaling devices. Lighting fixtures

### Fire protection equipment:

Fire engines.
Fire extinguishers.
Fire hose and related equipment.
Hydrants and related equipment.
Sprinkler systems.

### Transportation equipment:

Buses. Trailers (passenger-car).

### Miscellaneous products:

Automotive testing equipment and in-struments.

Baby carriages.
Church goods.
Drugs and medicinals.
Ice refrigerators.
Mattresses and bed springs.
Motion picture products.
Musical instruments.
Ophthalmic goods.
Pens and pencils and related office upplies. supplies. hotographic accessories. Plumbers specialties. Pulp and paper.

### Other products:

Sewing machines.

Other direct military products, manufacturing and construction equipment,

Signs.
Umbrellas and parasols.
Ventilating fans.

components of products listed elsewhere, and other construction materials.

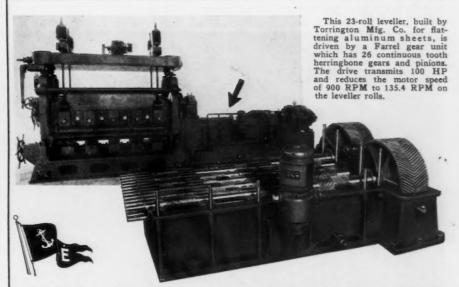
### Persons engaged in the following industries:

Aeronautics training (civilian).
Civil air patrol.
Commercial refrigeration and production of ice.
Construction.

Engraving on metal (except for printing)

Metal scrap salvage, sorting and processing of metal scrap.
Printing and publishing.
Public warehouses.
Radio communication and broadcasting.
Repair services for industrial and household equipment (motor and mechanical)

chanical).



### FARREL-SYKES HERRINGBONE GEARS Transmit Most Power in Least Space

The requirements for driving this 23-roll aluminum sheet leveller dictated a unit in which the pinions could be nested closely in order to connect the output shafts with the small diameter, closelyspaced leveller rolls. Six years of trouble-free performance have proved Farrel-Sykes continuous tooth herringbone gears and pinions to be admirably suited to this application.

Continuous tooth gears have a greater effective face width and a greater number of teeth in contact, giving them extra strength and extra bearing surface for high load-carrying capacity in small space.

The opposed helices balance and absorb axial thrust within the gear member, preventing harmful thrust loads and resultant stresses on other parts of the drive, without the need for space-consuming thrust bearings.

These and other inherent advantages of Farrel-Sykes gears account for their long-lived, economical and efficient performance in all types of drives, which make them the choice of engineers for critical applications.

We make gears and gear units for every type of service and offer the services of an experienced engineering staff for consultation on gear problems.

FARREL-BIRMINGHAM COMPANY, INC. 344 VULCAN ST. BUFFALO, N. Y. FAR REL

# Regulation No. 15 Clarified To Define Export Relaxations

Washington

• • • To correct an impression that the provisions of Priorities Regulation No. 15 make it unnecessary to observe any restrictions of WPB limitation and conservation orders in the manufacture of articles for export, WPB on Feb. 10 announced Interpretation No. 1 of that regulation. The interpretation makes it clear that Regulation No. 15 does not relax the restrictions of "L" and "M" orders, insofar as they apply to manufacture and inventory limitations within the United States. The only effect of the regulation is to lift restrictions on action within the United States to the extent that such

restrictions are based upon the size of an inventory abroad or the nature of an intended use in a foreign country. When an order requires administrative action, such as an allocation or express authorization, that requirement is not waived by Regulation No. 15, and must be met before the material can be delivered.

# Orders for Components To Be Given Consideration

Assurances were given to war contractors Feb. 9 by WPB Production Vice-Chairman Charles E. Wilson that orders involving production of critical common components to be used in the first half of 1943 will receive prompt consideration, even though they were not placed prior to the Feb. 6 deadline. Mr. Wilson said in a prepared statement that as emergecy situations develop new orders will be scheduled on appraisal of urgency.

Meanwhile, plans for special industry committees, or "task forces," to participate in the campaign for breaking bottlenecks in production of critical common components, were annnounced Feb. 9 by WPB.

Among items being studied are gears, valves, diesel and gasoline engines, crankshafts, compressors, pumps, heat exchangers, welding rods and electrodes, electric motors, starters and generators, boilers, vacuum tubes and control instruments.

Operating within each industry division concerned with the production of common critical components will be an advisory scheduling committee, or "task force." It will meet at regular intervals.

If one firm has too large a backlog of orders, while another has not enough to schedule work continuously for 1943, the committee will recommend transfer of work from one firm to the other. If a firm has excess capacity capable of turning out critical components, but insufficient labor supply, steps will be taken to see that it is provided with workers.

### Order Affects Trailer Buses

• • • Trailer buses designed and built for passenger service were placed under allocations control Feb. 9 by issuance of Order L-101 as amended. Included in the amended order are bus bodies for mounting on new or used commercial motor vehicles or trailer chassis as well as integral trailer buses which are completely assembled.



Young by the count of his years, but matured by the weight of the fears he has choked in the vise of his valor, this boy—a little homesick perhaps in his lonely vigil—is the symbol of the millions who will see their first star-shell.

What is he thinking about, out there in the sullen stillness of his post? Whatever it is, you may be sure it has something to do with the life, the people, the plans he left back here. They are a mental magnet to his thoughts—revised occasionally as he ponders what he will come back to.

If the pace of production has been maintained, if enough bonds have been bought, if more than words has been devoted to post-war plans, he will come back to feel his contribution has been worthwhile.

It is up to us, here and now, to discharge our obligation to him by producing more, by investing in bonds, by planning for the pent-up, unrationed needs of that day.

If new special-purpose machines are part of your post-war plans, you will want to send for a copy of "Facilities."

Designers and Builders of Intricate, Automatic Precision Machines



32 YEARS' EXPERIENCE

### FIDELITY MACHINE COMPANY

3908-18 FRANKFORD AVENUE, PHILADELPHIA, PA

# Farmer Needs Aided By L-Order Relaxation

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• • • • Despite all talk of "bedrock" civilian economy to come in 1943, WPB is seeing fit to call a limitation on limitation orders by permitting a restricted use of steel. Farmers are to benefit through the relaxation of two orders, L-170, controlling farm machinery and equipment, and L-30-a having to do with metal pails, buckets and washtubs, announced by WPB last week.

The farm equipment order removes various items of farm machinery and equipment including barn stock pens, bee hives, livestock feeders, etc., from the previous restrictions where such items are made entirely from certain listed non-critical materials. The use of re-rolled steel is permitted in the manufacture of cattle stalls, stanchions and stock pens which were specifically denied steel in the original order.

A new production quota of hydraulic rams was set under Schedule A at 49 per cent of the base rate and allots their manufacture of Class C producers. Production of water well casing from sheet steel is provided by the order at an 85 per cent rate measured by the base period.

The amended order permits a manufacturer to segregate 30 per cent of this base production of certain items of barnyard equipment, and add the value of the amount segregated to his repair parts quota. The remaining 70 per cent must be considered as new equipment and is governed by the quota percentages in Schedule A.

Hand tools such as hoes, rakes, etc., are removed from the restrictions of L-170. These items were transferred to Schedule 5 of Order L-157, issued Jan. 8.

At the same time, WPB revoked restrictions on sales by manufacturers of metal pails, buckets and wash tubs for general civilian use. Order L-30-a was so amended as to permit the use of steel in the production of these articles up to 50 per cent of a specified normal year. Previously manufacturers were limited to the use of 10 per cent.

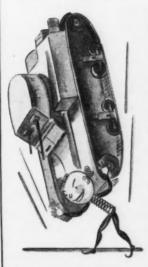
### Ferrochrome Limited

• • • Because available supplies of ferrochrome are limited, an order requiring the increased use of scrap and chrome ore in the production of stainless steel was issued Feb. 15 by WPB. The order, M-21-a, as amended, provides that at least 30 to 40 per cent of the chromium content of stainless steel must come from scrap and ore. The exact percentage is governed by the carbon content of the stainless steel involved.

It was emphasized that the amended order sets forth minimum requirements only, and that greater economies in the use of ferrochrome can and should be made by a majority of the stainless steel producers.

### PD Forms Named for Requesting Plasticizers

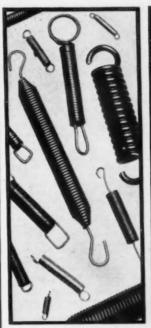
• • • Standard forms PD-600 and PD-601 must be used in the future in requesting allocations of phthalate plasticizers, the Director General for Operations ruled Feb. 6 through the issuance of Allocation Order M-203 as amended. Phthalate plasticizers are used in the manufacture of plastics, synthetic rubber, lacquers, and smokeless powders.



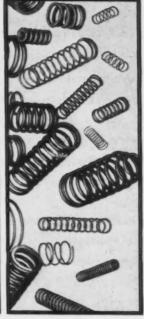
# MECHANIZED WARFARE needs millions of springs!

SO MUCH DEPENDS ON SPRINGS ... in tanks, planes, trucks, rifles, radio and signal devices, etc., millions of springs are at work in the very heart of war equipment ... tripping or releasing ... pushing or pulling ... holding apart or forcing together ... absorbing shocks or delivering blows.

IF YOU NEED SPRINGS, wire assemblies, wire parts or small stampings for war equipment, Cuyahoga's wide experience and facilities for applying the flexibility of spring and wire design to defense applications is available for direct war or sub-contractor requirements.











Form Origin Assistance Fenn Quick-Action Vise has been used in a wide range of work in industrial plants throughout the country. It is highly regarded by users because of its speed, accuracy and dependable service.

We have never yet had a Fenn Vise returned to us because of it's failure to perform as represented. Every Vise is built with the greatest precision for accurate work. Sliding and stationary jaws are precision fitted. All working parts hardened ground steel, with heavy duty base of fine grained, well seasoned iron. Why not put the Fenn to a real test in your plant?

Three sizes: 4", 5" and 7".

Send for Bulletin No. 10.

### Ratings on PD-1X Too Low to Supply Needed Inventory

Chicago

• • • Priority form PD-1X, the form used by distributors for making application for a priority rating, is failing utterly to provide a solution for the inventory replenishment problem, according to J. S. Amis, secretary and manager of the Chicago Retail Hardware Association. Ratings assigned on PD-1X are so low as to be meaningless, he said.

. "The manner in which PD-1X is operating is highly unsatisfactory and our experience is that it is not even beginning to accomplish its purpose of assisting distributors in maintaining a workable inventory.

"The rating assigned on PD-1X is almost invariably too low. The result is that the assignment of a rating on PD-1X is a meaningless gesture," Amis said.

As an example of how PD-1X operates, Mr. Amis cited the problem of a hardware distributor who, on Dec. 31, 1941, had an inventory of \$300 on a certain tool. Sales cut this inventory to \$150 on March 15 and, because of a war demand, expected to sell all of the tools by April 15. A chronological report of this man's experience with PD-1X follows:

March 15, 1941—Applies on PD-1X, explaining why the supply on hand would not last beyond April 15.

April 15—Notified that his application was rejected and that WPB considered the \$150 March 15 inventory ample. By this time his supply is completely exhausted, so he files a new PD-1X.

May 15—Receives rating of A-10. Manufacturer of the tools advises that this rating is too low to permit delivery.

June 30—Still no shipment from manufacturer. Writes to WPB explaining that A-10 is too low.

June 30—Still no shipment from manufacturer. Writes to WPB explaining that A-10 is too low.

July 15—Receives letter from WPP saying they believe A-10 was high enough. Distributor searches country trying to find manufacturer who can make delivery on A-10.

Aug. 1—Unable to place order with rating of A-10. Is advised by manufacturer that rating of A-1-a is needed. Advises WPB of this.

this.

Sept. 1—WPB sends back new application with rating of A-1-k. The amount he would be permitted to purchase is cut by WPB to \$100. Places order.

Oct. 1—Still no delivery from manufacturer, who advises that jam-up of ratings makes an AA-1 rating necessary now. Makes new application to WPB and is given rating of AA-1 with amount cut to \$60.

Nov. 1—Order placed. Is advised by manufacturer he will have to wait six months for delivery.

Whether the distributor went out of business or went crazy at this point is not revealed by Mr. Amis.

### Truck and Trailer Order

• • • To save an estimated 800 tons of iron and steel a month. L-253 issued last Thursday, is calculated to expedite the production of oil tank trailers. The type to be provided are those specified by Order L-1-g as

# Nearly 50 Years of Service to the Steel Industry

In the early days of our steel expansion, before the United States Steel Corporation had been formed, the Charles Dreifus Company had its beginning.

The Charles Dreifus Company, as a broker in iron and steel scrap, still has as its customers some who were its customers nearly 50 years ago (or their successors). We are proud of this record.

Steel companies and scrap producers, as well as such Government agencies as the War Production Board, the Office of Price Administration and the Army and Navy, recognize the important role of the scrap broker in keeping the iron and steel industry operating at a rate that will bring a speedy and victorious conclusion of the war.

We solicit further opportunities to be of service in the movement of iron and steel scrap from industrial plants, railroads and scrap yards to steel plants and foundries.

The

# CHARLES DREIFUS

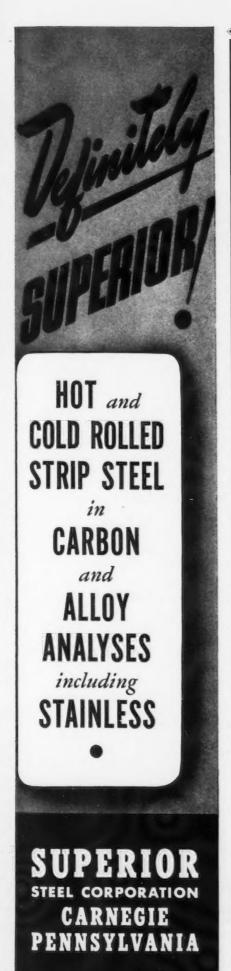
Company

(Broker in Iron and Steel Scrap for Nearly Half a Century)

Philadelphia, Pa. Widener Bldg. Rittenhouse 7750

Pittsburgh, Pa. Oliver Bldg. Atlantic 1856

Worcester, Mass. Park Bldg. Worcester 6-2535



### Handicapped Workers Assisting Production

Harrisburg, Pa.

• • • Production lines manned by handicapped workers in two Pennsylvania aviation plants were cited last week as outstanding examples of utilizing this source of manpower, as a total of approximately 2600 handicapped placements in 1942 was reported by H. Raymond Mason, state director of the U.S. Employment Service of the War Manpower Commission.

"One plant decided to staff an entire new unit with handicapped workers. Approximately 30 of these handicapped workers with eye, leg, arm, and various other types of disability are now in full production at the aircraft plant," Mason said. "The other plant began with several deaf mutes on an assembly line. This innovation worked so well that additional handicapped workers were requested by the company, and at present about 35 deaf mutes are employed."

amended Jan. 7. All other types may not be produced according to L-253. All types of truck and trailer bodies are placed under rigid control. Specific parts in which any iron or steel may be used are indicated.

### Zinc Control Tightened

• • • Control over use of zinc was tightened Feb. 9 with additions to Order M-11 which place remelt zinc under the same controls as the six higher grades, limit delivery of zinc by dealers to orders bearing ratings of AA-5 or higher, and regulate the transfer and use of zinc scrap. The order makes war controls over shipment and use of zinc virtually complete.

### Farm Repairs Eased

• • • Farmers are given further assurance that their farm machinery will not go unrepaired for the lack of welding rods and electrodes following action taken Feb. 10 by WPB. Regional Directors of WPB are now authorized to approve, countersign and issue individual preference ratings up to and including AA-1 on purchase orders for welding rods and electrodes used in repairing farm machinery and equipment. The same authority is given district managers to approve ratings up to and including AA-2X.



# Doing The the 1 Impossible?

Booth "prescription" felt...precisioncut into mechanical parts...is being used successfully in "unbelievable" applications.

Modern technology produces felts that must be reckoned with, when engineers choose their industrial materials. An impressive range in felt hardnesses, textures, and properties such as resiliency, oil-absorption, abrasion-resistance...

<sup>3</sup> Get a copy of Booth's abridged textbook, "The Technique of Felt Making." It will give you a new conception of the industrial importance of felt. May offer a quick solution to your own materials problem.

THE BOOTH FELT COMPANY 477 19th Street, Brooklyn, N.Y. 747 Sherman Street, Chicago, Illinois

COMBINATION APPLICATION CHART AND SAMPLE FILE

...yours for the asking. Standard file size. Contain's actual swatches of S.A.E. felt types, with complete specification tables. No obligation . . , no sales follow-up.

1908



# Observers Predict Ore Prices Will Stay though Costs Increase

Cleveland

• • • The negotiation of ore contracts for the coming shipping season will likely begin with no indication from OPA that increases will be permitted in ore prices. In fact, some authorities feel that increases in price are definitely unlikely in spite of the fact that the present established ore price of \$4.45 is as low as at any time since 1928. Even with this figure as the ceiling price, many individual companies are selling at even lower prices, with the average price being somewhere around \$4.335. This variation in prices resulted from the freezing order on prices by the OPA last year, which caught many companies selling below the so-called published price.

Meanwhile, costs including freight, labor and taxes have increased steadily since the price freeze, and to meet the 101,000,000-ton demand of WPB for the coming lake season a great deal more of the ore will have to come from high cost underground mines. One of the bigger cost factors is the 3 per cent freight tax that was placed on inter-state shipping early in December, 1942. While for the upper and lower rail freight this tax can be passed on to the consumer, the lake freight tax must be borne by the producer, raising the lake shipping rate from about 77 to 80c. a ton.

While in some quarters it is believed that if there is no general price increase forthcoming from OPA there will be little or no opening of new mines and concentration of effort will be on high grade and easily mined ores, it may be that by opening new mines a higher average price for ore during the coming year may be realized. By mixing this ore with

that coming from mines already in production, a higher price might be effected, since the price of the mixed ore is based on the proportionate weights of the mix, with the permitted price for the new ore raising the average price.

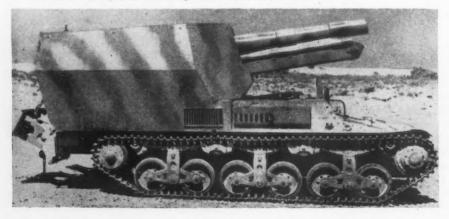
### OPA to Explain Secondary Steel Prices

Cleveland

• • • The new dollar and cents price ceiling system for the resale of secondary steel products that will be established shortly by OPA will be explained to warehouse jobbers and distributors at meetings in New York and Cleveland, held under the joint sponsorship of the OPA Warehouse Branch and the Steel Products Warehouse Association, Inc., of Cleveland. E. L. Wyman, chief of the OPA Warehouse Branch, and staff members, will speak at these meetings and give practical answers to specific questions on the pricing practices under the new schedule. These meetings will be held on Feb. 24, at the Hotel Pennsylvania in New York, and on Feb. 26, at Hoted Statler in Cleveland.

The pricing system to be established by OPA, C. M. Ballou, president of the association said, probably will determine prices for the duration on all secondary steel products sales. Among the products covered by the forthcoming price schedule are: cold and hot rolled sheets, galvanized and galvannealed sheets, long ternes, hot and cold rolled strip, sheared and universal mill plate, tin mill black plate, and semi-finished iron and steel products.

NAZI WEAPON: A new model German armored 15-cm. gun on self-propelled mount. This photo evidently was taken in Africa.



132-THE IRON AGE, February 18, 1943

# 50c. Increase Granted Oven Coke from District 2

Washington

• • • Recent price increases for bituminous coal to cover overtime labor for a six-day week and other higher operational cost were reflected Feb. 10 in OPA advances of 50c. a ton in the maximum prices of beehive oven coke produced in Pennsylvania and three (Monongalia, Preston and Upshur) West Virginia counties.

Beehive oven coke (other than furnace coke produced in Pennsylvania) is dependent on bituminous coal from District 2 (Western Pennsylvania) and District 3 (West Virginia). In District No. 2 coal prices have been advanced to yield an added realization of 23c. a ton, in District 3, 19c. a ton. In addition to the higher price for coal, beenive coke producers have also experienced higher operations costs including labor. The industry declares it cannot absorb the added costs and continue operations which are vital to the manufacture of steel.

Beehive coke maximum prices are established under MPR No. 121 and are based on prices prevailing during the base period of Dec. 15-31, 1941.

# OPA Sets Limit on Coal Service Charges

Washington

• • • Service fees which bituminous coal distributors handling Lake or Tidewater shipments charged during the base price period (Oct., 1941) are the maximum amounts which may be added for such services to current ceiling prices, OPA stated Feb. 11.

Some distributors who handle shipments via water perform special services including chartering vessels and assembling cargoes for which they have customarily added a fee. OPA requires each distributor to request and obtain specific permission before adding such service charges to maximum prices.

OPA's action is contained in amendment No. 39 to Maximum Price Regulation No. 120 effective Feb. 16.

### Seeks to Leave WPB Post

Washington

• • • Walter E. Chollar, deputy director of the WPB Facilities Division, has asked to be relieved of his duties in order that he may return to active work as vice president of the Remington-Rand Co.

# New Prices Expected On Resale Secondary Steel

Washington

• • • At OPA it was stated last Saturday that it will be about two weeks before it completes its dollar-andcents schedule covering secondary steel products, which consist of rejects and wasters. The schedule will replace the present pricing system of these products. Under the existing system, prices of secondary steel products are computed as of April 16, 1941, but in no instance can they be higher than the prices of prime products. The reason given for the change to the dollar-and-cents basis of pricing is that the present system is indefinite by reason of the various methods used in calculation.

### OPA Simplifies Modification of Ceilings

Washington

The OPA set up Feb. 11 a simplified procedure for modification of ceiling prices on products covered by Maximum Price Regulation No. 188 (manufacturers maximum prices for specified building materials and consumers goods other than apparel) and is contained in amendment No. 6, effective Feb. 16.

The amendment permits OPA to issue an order modifying the maximum price for any commodity covered by the regulation. This provision is intended for use only in general situations affecting an industry or a segment of an industry.

In the first action taken under the amendment, OPA set a new maximum price for refractory flint clay of \$2.75 a ton delivered in Taylor, Ky., for producers of clay within 35 miles of Taylor. This ceiling represents an increase of approximately 50c. a ton to cover increased labor costs and increased costs of hauling and equipment maintenance. Manufacturers using the clay have agreed to absorb the increase.

### OPA Lifts Ferrochrome Maximum to Government

Washington

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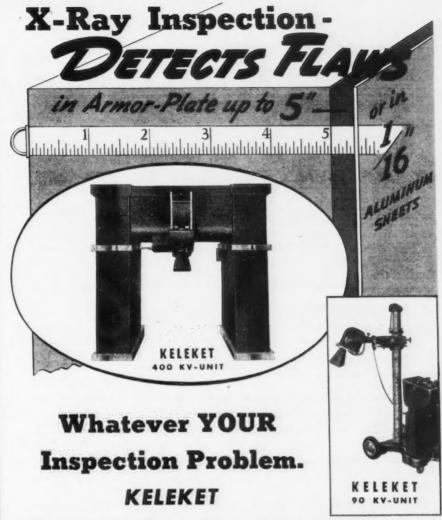
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• • • Packaging differentials may be added to the maximum price for ferrochromium when it is packed for shipment in carload lots, and also when it is shipped to government procurement agencies in special containers, OPA said Feb. 10.

The charge permitted to cover the



### has the right X-Ray Unit to solve it!

FOR the X-ray inspection of heavy casting or armor-plate up to 5 inches thick, the KELEKET 400 KV self-contained unit, illustrated above, is furnished as a stationary model or mounted on rails for mobility.

For inspecting lighter metals the KELEKET 90 KV unit, shown at the right—completely self-contained, and mobile—can be readily moved anywhere in the plant.

Between these two extremes of X-ray inspection are other KELEKET industrial units to provide a full range of radiographic examination. In addition, there is KELEKET equipment for microradiography and diffraction analysis.

Whatever your inspection requirements may be, KELEKET has an X-ray unit that is adequate—better consult with KELEKET'S industrial X-ray engineers NOW.

THE KELLEY-KOETT MFG. CO., (Industrial Division) 230-2 West Fourth Street, COVINGTON, KY.

Representatives in 64 Cities



PIONEER CREATORS OF QUALITY X-RAY EQUIPMENT SINCE 190

### This Week's Priorities and Prices

Zinc was placed under tighter control by amended order M-11, which places remelt zinc under the same controls as higher grades, limits delivery of zinc by dealers and regulates the transfer and use of zinc scrap. (WPB-2482)

Transfers of idle machine tools to plants urgently needing them are authorized under a policy established by the WPB. (WPB-2495)

Welding rod and electrode purchases for use in repair of farm machinery have been granted a higher preference rating. (WPB-2504)

Steel scrap prices at shipping points in Hudson and Bergen counties of New Jersey have been reduced

5c. per gross ton in Amendment No. 11 to Revised Price Schedule No. 4, effective Feb. 16. (OPA-T-574)

Stainless steel producers have been ordered to increase the use of scrap and chrome ore in the production of steel in an amendment to order M-21-a. (WPB-2520)

For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 means announcement 600 issued by the War Production Board.)

### Revisions to The Iron Age Priorities Guide

• • The following data, together with all intermediate weekly revisions in THE IRON AGE, should be added to THE IRON AGE Priorities Guide published with the issue of October 8 to bring the Guide up to date.

Priority Regulations:

No. 15...Interpretation No. 1 indicates that relaxation of inventory restrictions in order does not apply to accumulations of inven-tories to be incorporated in goods for manufacturer (2-9-43).

M-11...Amended order tightens control over use of zinc (2-9-43).
M-21-a...Amended order requires increased use of scrap and chrome ore in the production of stainless steel (2-12-43).
M-29-b...Amended order tightens control over tungsten (2-8-43).
M-50...Amended order further restricts use of jewel bearings (2-9-43).

L-30-a...Amended order revokes restrictions on metal pail production (2-11-43).

duction (2-11-43).

L-63... Amended order removes control over distribution of domestic mechanical refrigerators (2-11-43).

L-101... Amended order places trailer buses for passenger service under allocation control (2-9-43).

L-170... Amended order modifies restrictions on production of farm machinery (2-12-43).

...acminery (2-12-43).
L-187...Amendment increases quotas of iron and steel for production of low-pressure boilers (2-13-43).
L-250...Order simplifies standards for controllers for electric motors (2-13-43).

L-253...Order provides for production of truck and trailer bodies (2-11-43).

cost of packing carload lots in barrels or drums is \$7 per gross ton. To this base charge may be added \$3 per gross ton for shipments to the government procurement agencies, as for Lend-Lease, if packed to the buying agency's specification in 50-gal. barrels or drums; \$6 per gross ton on such shipments if packed to the buyer's specifications in containers of less than 50-gal. capacity.

No change is made in prices for l.c.l shipments, as these are ordinarily sold packed and the price differential now provided is believed to be adequate. However, if less-than-carload shipments are made to government procurement agencies, the additional charges for special packing may be added. The changes are made in amendment No. 107 to Supplementary Regulation No. 14 to the GMPR, effective Feb 16

### **OPA Grants Price** Rise on Southern Coal

Washington

• • • Increases in the maximum prices for bituminous coal produced in Districts 7 and 8, the two major southern coal producing districtsconsisting primarily of regions in West Virginia and Kentucky, and to a lesser extent in Virginia, North Carolina and Tennessee, was authorized last Saturday by the OPA in Amendment No. 40 to MPR No. 120, to balance overtime wages for a six-day work week and added costs of operation becoming effective since ceilings originally were established in April, 1942.

The increases for low volatile coals range from 5 to 45c. a ton, and the increases for high volatile coals range

from 15 to 25c. a ton. The increase in both districts on railroad locomotive fuel is 25c. a ton.

The increase in prices is to be passed on to the consumer and is similar to increases granted in other bituminous coal producing districts. This is in line with agreements between the United Mine Workers of America and mine operators, permitting operation of a six-day work week instead of the previous 35-hour five-day week.

### Prices Exempted on Domestic Manganese

• • • Sales of domestic metallurgical manganese ore to dealers for resale, and to users or processors who use the ore directly in producing steel or in foundry operations, or in spiegeleisen and other sub-standard forromanganese, were exempted from price control today by OPA.

Less than one per cent of United States consumption is affected by the action which was taken to meet particular situations in the industry that do not affect price control over the bulk of manganese ore consumed.

Through Amendment No. 2 to Maximum Price Regulation No. 248, Man-

ganese Ores, effective Feb. 20, 1943, the sales are exempt from control under that regulation or the General Maximum Price Regulation, although still subject to record-keeping provisions of MPR No. 248.

Ores affected are sold only in small amounts, and do not need to meet rigid specifications as to impurities required by producers of standard ferromanganese, low and medium carbon ferromanganese, and silicomanganese.

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Exemption of sales to dealers for resale relieves dealers and miners of the need to obtain complete analysis which otherwise would be necessary to determine the maximum price on sales of small amounts of ore.

### Nelson Dismisses Eberstadt And Gives Wilson His Duties at WPB

Washington

• • • WPB Chairman Donald M. Nelson last Tuesday dismissed Program Vice Chairman Ferdinand Eberstadt in a move which may presage Mr. Nelson's also leaving WPB. The action culminated several months of internal dissension in which Mr. Nelson, Mr. Eberstadt and Production Vice Chairman Charles E. Wilson figured.

At the same time WPB announced Mr. Eberstadt's dismissal, Mr. Nelson announced that Mr. Wilson had been appointed WPB executive vice chairman in charge of the whole operating end of the war agency. Mr. Wilson takes over all the duties formerly vested in Mr. Eberstadt including control of industry divisions and the operation of the Controlled Materials Plan.

Mr. Nelson ousted Mr. Eberstadt, as one WPB spokesman put it, to prevent Mr. Eberstadt from getting the WPB top seat. Mr. Nelson has been convinced that the Army and Navy backed Mr. Eberstadt for this position, leaving Mr. Nelson as a "front" man. For many months the story was circulated by WPB officials that Mr. Nelson would attempt to deemphasize Mr. Eberstadt's importance by building up the duties of Mr. Wilson.

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Mr. Nelson has had a job of unparalleled difficulty in running the war production machine and has been subjected to the cross-fire of congressional committees and the War and Navy Departments. Competent observers say that the furor and opposition from members of Congress and industrialists not to say high-ranking Army and Navy officials, will force Mr. Nelson to likewise resign.

Some WPB officials close to Mr. Nelson have recently said that the "silver cord" between Mr. Nelson and Barnard M. Baruch has been severed, straining a friendship which up to now has been conceded an asset to the war effort.

WPB spokesmen said that Mr. Nelson called Mr. Eberstadt to his office Tuesday morning and simply told him that in the interests of bringing harmony to WPB and to end jurisdictional questions, he had decided to ask for Mr. Eberstadt's resignation. At the time the WPB statement was released, no resignation had been submitted by Mr. Eberstadt but it was

indicated he would have no choice. There is to be no other WPB change in personnel except that Mr. Eberstadt's immediate staff is expected to resign, spokesmen declare.

In announcing the change, Mr. Nelson said:

"I have made this move in order to solve organizational problems which have come about because carefully scheduled production is now the most pressing problem before us. It is my conviction that this change will bring harmony to WPB and end jurisdictional questions which, if permitted to continue, could only hamper the war effort. . . . In other words, materials control and production control today are all one integrated job. They cannot be considered separately. They must be directed as one job, not two."

### Galvanizers Will Hear WPB Men at Annual Session

• • • The 1943 annual meeting of the American Hot Dip Galvanizers Association, Inc., will be held at the William Penn Hotel, Pittsburgh, on Wednesday and Thursday, Feb. 24 and 25. Scheduled to speak at the technical session are E. Barrett Mason, Controlled Materials Plan, WPB, Washington; F. M. Carlson, zinc division, WPB; Herbert J. Taylor, price adjustment board, War Department; Brig. Gen. William C. Rose, bureau of manning tables, War Manpower Commission; D. L. Colwell, non-ferrous metals substitution section, WPB, and Wallace G. Imhoff, technical director of research of the association.

### Steel Production Up 3000% Over 1775

• • • Today the United States can make as much steel in three hours as the entire tonnage of iron produced in the thirteen colonies during 1775, according to the American Iron & Steel Institute.

The amount of steel made in America at the time of the Revolution was negligible, although colonial production of iron stood at 30,000 tons annually and comprised about one-seventh of the world's annual total.

By 1865, annual output of pig iron in the United States had risen to over 1,000,000 tons.

### Milestones

• • • During 1943, with the plant's manufacturing facilities geared to produce war materials at full capacity, the management and personnel of The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., will celebrate the 50th anniversary of its founding as the Manhattan Rubber Mfg. Co.

The original company was incorporated on Oct. 28, 1893, during the panic which lasted from 1893 to 1897. Two months after the formation of the company, manufacturing operations started in one small building with a crew of 40 men. The merger which formed Raybestos-Manhattan, Inc., occurred in 1929.

Two of Manhattan's early executives and several employees have been with the company for more than 45, years. These officials are F. L. Curtis, now vice-president and treasurer of Raybestos-Manhattan, Inc., who was manager of the company's original factory office, and C. T. Young, factory manager, who was assistant to Mr. Curtis in the early factory office. Another early employee is C. E. Cummings, at present assistant secretary.

### Two Steel Firms Seeking Iron Sites in Adirondacks

Mountains are being surveyed by two nationally known steel companies for possible new developments of iron mines, the New York State Division of Commerce has disclosed. Names of the companies are being withheld at their request until actual operations begin. Information on the deposits of iron ore which the steel companies propose to develop was obtained by the Division of Commerce as a result of field operations last fall.

Minerals other than iron ore have been discovered in smaller quantities. These include flake graphite, bronze and copper alloying materials, mica, garnet, zinc and lead.

In 1942 Adirondacks iron-ore output reached 3,000,000 tons. Production in 1943 is expected to reach the 8,000,000 mark.

The Andover and Sulphur Hill Mines in New Jersey have also been surveyed by the Bureau of Mines, but results of these investigations are now known.

# PERSONALS

- Benjamin F. Harris has resigned as president of National Tube Co., Oil Well Supply Co. and Tubular Alloy Steel Corp., subsidiaries of U. S. Steel Corp., effective Feb. 28. Mr. Harris will remain with U. S. Steel as a consultant to Mr. Fairless in connection with war activities. Mr. Harris has been connected with companies now forming a part of U. S. Steel for over 30 years.
- J. R. Moore has been appointed superintendent of Republic Steel Corp.'s Spaulding ore mine at Birmingham. Before entering the contracting business, he had been associated with the Tennessee Coal, Iron & Railroad Co., Gulf States Steel Co., Woodward Iron Co. and Hercules Powder Co., in various capacities.
- J. P. Yates has been named general manager of Bechtel-McCone-Parsons Corp.'s new aircraft modification plant at Birmingham.
- John C. Traphagen, president of the Bank of New York, and Robert L. Beattie, vice-president and general manager of the International Nickel Co. of Canada, Ltd., have been elected to membership on the board of directors of the International Nickel Co.
- W. H. Sickinger has been appointed director of production of the Fostoria Pressed Steel Corp., Fostoria, Ohio. Prior to his appointment, Mr. Sickinger was in charge of development of the company's line of commercial cooking equipment.
- W. C. Henning has been elected president and treasurer of A. Leschen & Sons Rope Co., St. Louis. John A. Leschen has been appointed vice-president, Arthur A. Leschen, vice president in charge of plant and production and James A. Burns, secretary.
- Commander R. E. W. Harrison, U.S.N., who returned in July, 1942, to Chambersburg Engineering Co., Chambersburg, Pa., in temporary inactive duty status, has been recalled to active duty Feb. 1. Commander Harrison, who has been associated with Chambersburg Engineering Co. as vice-president since 1934 and also as a member of the firm of Clarke-Harrison, Inc., Philadelphia, was in active service in the Navy from July, 1940, to July, 1942. His return to active duty will be in the office of the

Under-Secretary of the Navy, serving directly under Admiral H. G. Bowen.

• Herman Franck, formerly general superintendent of the Dunkirk, N. Y., plant of American Locomotive was recently named plant manager to succeed the late Edmund F. Boswell, who died last November. Replacing Mr.



BENJAMIN F. HARRIS has retired as president of three U. S. Steel subsidiaries.

Franck as general superintendent at Dunkirk is Eugene Murphy, an employee of the company for 30 years, who had been superintendent of the plate shop. Other Dunkirk appointments are as follows: Robert Moore, assistant superintendent in connection with the pipe, exchanger and gun work; Arthur Ganslow, assistant superintendent in charge of exchanger work; Andrew Groesch, foreman of the plate shop; and Joseph Langenstien, foreman of the machine shop.

- Hoy O. McIntire has joined the research staff of Battelle Memorial Institute, Columbus, Ohio, where he will be engaged in metallurgical research and development. He was associated with the Carnegie-Illinois Steel Corp. in its Gary sheet and tin mills before going to Battelle.
- William MacMurtrie has been named assistant general purchasing agent of Philco Corp. Mr. MacMurtrie became connected with Philco in 1935, when he joined the purchasing department.
- J. B. DuPrau has been appointed assistant to William A. Ross, presi-

dent of Columbia Steel Co., West Coast subsidiary of United States Steel Corp. Mr. DuPrau joined Columbia in 1935 as chief statistician. In 1936 he headed the company's market research and sales analysis, later adding sales promotion and advertising to his responsibility. In 1939 Mr. DuPrau was transferred to the president's office in charge of planning and research.

- Jack Jarvey Hammerschlag, production engineer for the Flak Corp., Milwaukee, has been named an ensign in the Navy Bureau of Aeronautics.
- Louis F. Theurer, industrial sales manager of the Milwaukee paint division of the Pittsburgh Plate Glass Co., has been appointed west coast divisional manager to succeed Floyd S. Green, who is retiring. Mr. Theurer's position at Milwaukee is being filled by R. I. Ogle, industrial paint representative at Chicago.
- A. W. Baker has been appointed transportation specialist of the General Electric Atlanta Transportation Department. Mr. Baker succeeds the late F. A. Kroner.
- C. V. Briner, who has been associated with the Pratt & Whitney Division of Niles-Bement-Pond Co. for 20 years, is now affiliated with Pipe Machinery Co., Cleveland. He will work with William L. Benninghoff, president of Pipe Machinery, in the sale of precision gages and tools.
- Captain Nelson W. Pickering, USNR, president of Farrel-Birmingham Co., Inc., has been assigned to duty as commander of U. S. Navy Section Base at New London and commander of local defense forces in that
- Chester F. Conner, manager distributor sales, industrial products division, the B. F. Goodrich Co., has been appointed to the staff of advisers on mechanical rubber goods in the Office of Rubber Director, War Production Board, Washington, D. C.
- Stanley Norrick has been appointed general foundry engineer of the Perfect Circle Co., New Castle, Ind. Richard H. Bancroft, formerly assistant plant manager of the New Castle plant, has been named manager.
- Richard Calvert, sales representative in eastern and central Pennsylvania for the Carpenter Steel Co., has announced his retirement after rounding out 30 years of service with the company.

- E. H. Fritschel has been placed in charge of sales of industrial electronic tubes, in addition to having responsibility for the sale of radio transmitter tubes, at General Electric's radio, television and electronics department, at Schenectady. Mr. Fritschel succeeds Dr. H. A. Jones, who is now a lieutenant-colonel in the U. S. Army Signal Corps.
- Edward E. McGinley has been appointed chief metallurgist at Youngstown District Works, of Carnegie-Illinois Steel Corp., while William F. McGarrity and A. T. Reichenbach were given similar appointments at Edgar Thomson and Irvin Works respectively.
- Rowland J. Black has been named factory manager and Don E. Miller assistant factory manager at Buffalo Arms Corp., Buffalo.
- Glenn J. Moorhead, formerly Pittsburgh representative for the Mixing Equipment Co., Inc., New York, has been appointed eastern divisional sales manager.

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- William W. Dunnell, Jr., has been appointed to the staff of the division of industrial cooperation of the Massachusetts Institute of Technology as chief engineer of Project 6060. Mr. Dunnell was formerly associated with the Reece Button Hole Machine Co., Boston.
- Carle C. Conway has been elected president of the Continental Can Co., Chicago. He will also retain his office as chairman of the board of directors. Sidney J. Steele, formerly executive vice-president, will be vice-chairman of the board.
- Welling F. Thatcher has joined Cross Gear & Machine Co., Detroit, as management executive and will assist Milton O. Cross, Jr., president. Mr. Thatcher was recently president of  $\bar{\mathbb{U}}$ . S. Steel's subsidiary in Brazil.
- Ralph G. Detmer, general manager of the American Frog & Switch Co., Hamilton, Ohio, has been elected vice president of that company, a subsidiary of the Taylor-Wharton Iron & Steel Co.
- Dr. G. M. Butler, formerly research engineer in the Dunkirk laboratories of Allegheny Ludlum Steel Corp., has been named chief metallurgist in charge of technical control and research. Before becoming a research engineer on internal combustion engine valve steels at Allegheny Ludlum, he was associated with the U. S.

- Bureau of Mines and the Climax Molybdenum Co. R. T. Eakin has been made assistant metallurgist at the same Allegheny Ludlum plant.
- D. A. Shardelow has been appointed district sales manager at Indianapolis for Republic Steel Corp. Mr. Shardelow goes to Indianapolis from Dayton, where he has been in the Republic sales office since 1936.
- I. H. Anderson has been named district manager of sales for the Steel and Tubes Division of Republic Steel Corp. in New York. Mr. Anderson succeeds L. M. Hogan who resigned.
- F. Richardz has been appointed manager of the gearing engineering department of the Nuttall Works, Westinghouse Electric & Mfg. Co., Pittsburgh, to succeed S. L. Crawshaw. Mr. Richardz has been a member of the gearing engineering department at Nuttall since 1931. S. L. Crawshaw will take up duties as a special assistant to Thomas J. Bannan, executive vice-president of the Western Gear Works, Los Angeles. Mr. Crawshaw will assist Mr. Bannan in engineering and technical matters.
- C. F. Christopher has recently accepted a position with the Continental Roll & Steel Foundry Co. In his new affiliation Mr. Christopher will have charge of general steel melting practice for the three plants, located in Pittsburgh, Wheeling, West Va., and East Chicago, Ind.
- Fred J. Robbins, of Bliss & Laughlin, Inc., has been elected vice-chairman and program committee chairman of the Chicago chapter of the American Society for Metals, to succeed Fred C. Smith, Carnegie-Illinois Steel Corp., who has been transferred to Louisville. Mr. Robbins previously had served as seminar committee chairman.
- · S. H. Hobson has been elected president and a member of the board of Geo. D. Roper Corp., Rockford, Ill., to succeed Mabon P. Roper, who died recently. Before his advancement, Mr. Hobson served as executive vicepresident of the corporation and also as president of the Roper-owned Blackhawk Engineering Co. Mr. Hobson first became associated with the company 28 years ago as an assistant foreman. All other officers of the company were reelected. Manufacturing operations at Roper will be under the supervision of works manager Otto Olson.

### OBITUARY ...

- William H. Shea, president and founder of the New Jersey Blower & Mfg. Co., died Jan. 19.
- S. P. Larsen, district sales engineer for Hubbard & Co., died recently. He was 53 years old.
- William J. Harris, vice-president in charge of purchase of the American Car & Foundry Co., died Feb. 7 at his home. He was 68 years old. Mr. Harris had been employed by the company for 54 years and was promoted from purchasing agent to vice-president three years ago.
- Harry D. Siegele, for 40 years connected with Belmont Iron Works in the capacity of structural engineer, salesman, and for the past three years as director of the company, died Jan. 31 after a brief illness.
- Michael L. McGuire, foundry consultant for George F. Pettinos, Inc., Philadelphia, and George F. Pettinos (Canada) Ltd., Hamilton, Ontario, died on Jan. 18, at his home after a six months' illness. He was 63 years old.
- Mason Hulett, chief, industrial gear and speed reducer unit, Material Handling Equipment Branch, WPB, died Feb. 7 in Washington. Mr. Hulett was with the Falk Corp., Milwaukee, for a number of years and more recently with the Farrel-Birmingham Co., New York.
- Job Goostray, honorary life member of the American Foundrymen's Association for his contributions to foundry practice, and for many years superintendent of the Hunt-Spiller Mfg. Corp., South Boston, died recently, aged 92 years.
- George L. Haupt, one-time hull superintendent of the Bethlehem Steel Co., Fore River Works, died Jan. 29, aged 75 years. He retired in 1938 after 14 years as superintendent of the Electric Boat Co., New London, Conn.
- Alvin H. Nichols, controller and director of Buhl Sons Co., Detroit, died Feb. 4, aged 79 years. He recently completed 50 years of service with the firm.
- Albert H. Reiber, vice-president in charge of development and research for the Teletype Corp., Chicago, died Feb. 1. He was 49 years old.

### Builders Face Declining Orders, Conversion Problem

Cleveland

• • • The machine tool industry, according to the National Machine Tool Builders Association, has already completed the major portion of its job of re-tooling America for war and before the year is over will be looking for more work to do. Furthermore, the last three years' production has gone into the war effort and weapons being used today were made on machine tools built before Pearl Harbor.

The industry's backlog of unfilled orders, at the present time, according to the Association, represents seven to eight months' output, and orders are showing a rapid decline from the 1942 rate. While this estimated backlog for the industry as a whole seems at first glance rather limited, it has been indicated by some individual producers that backlogs are somewhat shorter. It is certain, of course, that the machine tool demand will remain heavy throughout the war, but individual companies may within a short time find demand falling below capacity.

Charles J. Stilwell, president of Warner & Swasey Co., one of the nation's largest producers of turret and engine lathes, in discussing postwar reserves in a letter to stockholders, recently said that unlike most items vital to the war, machine tools

The new government order covering transfer of idle machine tools will be found on page 109.

are not expendable and turret lathes built for war today will remain installed and available in the factories after the war is over. Since the task of re-tooling America for war may be nearing completion, to utilize full production facilities of Warner & Swasey plants efforts will be made to manufacture other lines.

Progress, said Mr. Stilwell, is already under way in this direction. The expanded plant, the type of production equipment, and the trained personnel of the company makes it particularly suited to the manufacture of a variety of items such as aircraft parts, tank parts, gun parts, and the like, requiring a high degree of accuracy.

The combination of the durability of machine tools and the shifting around from plant to plant of idle machine tools, recently authorized by WPB, will do much to bring the machine tool building program to an end.

However, the industry must consider what will be done with this greatly expanded capacity, if it is found that within the next 12-month period the demand for war items eases to a large extent. It must choose, in some instances, either to convert its production entirely to other fields or die. As pessimistic as this may sound, it is evident that the older and more financially sound businesses, which have been expanded to a great extent, will live through such a transitional period, but the multitude of newcomers into the field will either get out again or close up shop. Where to go and what to do is the question now on practically every builder's mind.

### More Defense Plant Corp. Contracts Are Announced

Washington

• • • Among recent Defense Plant Corp. contracts were the following:

Studebaker Corp., South Bend, Ind., to provide additional facilities in Illinois at a cost in excess of \$11,200,000, making a total commitment of more than \$83,750,000.

National Carbon Co., Inc., New York, to provide additional plant facilities in North Carolina at a cost in excess of \$1,450,000, making a total commitment of more than \$7,550,000.

Wenatchee Alloys, Inc., Canton, Ohio, to provide additional equipment for a plant in Washington, at a cost in excess of \$150,000, making a total commitment of more than \$1,300,000.

Ferro Enamel Supply Co.

Ferro Enama \$1,500,000.

Ferro Enama Supply Co., Cleveland, to provide additional plant facilities in Ohio, at a cost in excess of \$145,000, making a total commitment of more than \$935,000.

Kohler Co., Kohler, Wis., to provide

Kohler Co., Kohler, Wis., to provide plant facilities in Washington at a cost in excess of \$465,000.

Eastman Kodak Co., Rochester, N. Y., to provide additional equipment for a plant in New York, at a cost in excess of \$380,000.

Ozark Mountain Distilling Co., Joplin, Mo., to provide equipment for a plant in Missouri.

### Heads Southern Board

Birmingham

• • Joseph L. Bedsole, Mobile, Ala., financier, has been appointed chairman of the Price Adjustment Board of the Birmingham Ordnance District, comprised of five Southeastern states. Mr. Bedsole succeeds Crawford Johnson, Birmingham, who died Dec. 9.

### Demand Slightly Stronger Cincinnati Builders Report

Cincinnati

• • • Manufacturers here indicate that the balance between cancellations and new business is being weighted just slightly by the new business side of the scale bringing demand into a slightly heavier position than the reduction of backlogs. Emphasis continues to be most strongly on airplane and maritime needs, manufacturers indicating that in all other types of machines pressure has slightly eased. Reports of pressure for shell steel machinery emanating from other areas apparently finds little or no echo in this region, and in fact, one manufacturer indicated that this information was that such equipment was adequate.

Announcement of the 48 hr. week made little or no impression on war industries in this area, because all of them have been running at about that or even longer. The need for skilled men continues but plants are steadily rounding out their forces through their learner programs. So far, no great amount of employment has been reported.

### Bulletin Reports Tests of Riveted and Welded Joints

• • • Engineering Experiment Station Bulletin series No. 337 of the University of Illinois, Urbana, reports "Tests of Riveted and Welded Joints in Low-Alloy Structural Steels." The research work was done in cooperation with the American Bridge Co. by Wilbur M. Wilson, Walter H. Bruckner and Thomas H. McCrackin, Jr., all of the University staff.

Riveted joints and rivets were examined for initial tension in the rivets and for the ratio of strength of the joint in shear to the strength in tension. It was found that the net sections of the plates of small riveted joints developed a unit strength about 10 per cent greater than that developed by coupons cut from the same parent plates.

Report No. 337 also includes metallographic analysis of riveted joints and hardness surveys in the heat-affected zone of the butt weld. The Bulletin may be obtained from the University for 80c.

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Scratch One Flat-Top"—there's a story behind these words that's never been told—it's a story of American ingenuity, careful workmanship, design and production—a story of precision machine tools, like the

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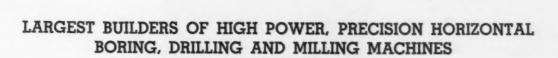
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Giddings & Lewis 350-T High Power, Precision, Horizontal Boring, Drilling and Milling

Machine illustrated above, doing a job that produces planes whose pilots make history in words like these. The G&L Horizontal shown above is milling the flange surface of a large airplane fixture — holding the overall flatness to .005". This is but one of many precision jobs handled for the aircraft industry. Boring, Drilling, Milling, Facing, Tapping and Thread Cutting operations are performed on other large fixtures to unbelievably close tolerances, and in record time.

We're proud of the machine that does these jobs that eventually deliver the planes worthy of the men that fly them—jobs that help to "Scratch One Flat-Top."



GIDDINGS & LEWIS MACHINE TOOL CO.
Fond du Lac, Wisconsin

Table, Floor, Planer and Multiple Head Types

# NON-FERROUS METALS

. . . Market Activities and Price Trends

# WPB to Start Scrap Segregation Drive

• • • With scrap yards unable to meet the competition of wages paid in war plants, dealers can no longer be depended upon to segregate nonferrous scrap properly. In order to help the dealer, the Industrial Salvage Branch of WPB's Conservation Division plans to start an intensive educational program directed at fabricators to segregate the scrap formed during their operations according to the analysis of the metal.

The Industrial Salvage Branch considers the first phase of its campaign, that of getting plants scrap conscious, ended. From now on the emphasis will be on scrap segregation at the source.

### Copper Scrap Needed

• • • The Salvage Branch will also launch a campaign to salvage scrap copper from all industrial plants, railroads, public utilities, mines, shipyards and from the armed forces. This campaign follows a report issued last month by H. O. King, director of the Copper Division, spiking statements quoted in the press that have conveyed the impression that the supply of copper is adequate to meet all military and essential civilian requirements. Mr. King declared at that time that the supply of copper is not adequate and never will be while this war is on. A partial list of the industries that will be asked to cooperate in this drive includes industrial electrical equipment, machine tools, automotive, plumbing and heating, aircraft and chemical industries.

### New Copper Committee

• • • • A combined copper committee representing the United States, United Kingdom and Canada, has been appointed by the Combined Production and Resources Board and the Combined Raw Materials Board with the primary responsibility for assembling and reviewing data relating to the supply, requirements, inventory and consumption of copper in order that the copper supply available to the three countries may be utilized to the best advantage in war production.

Creation of the Copper Committee followed a preliminary survey by staffs of the Combined Production and Resources Board and the Combined Raw Materials Board of the copper situation in the three countries. The report indicated the need for comprehensive and better integrated information on supplies available to the three countries, their respective requirements and the nature of the programs entailing the use of copper. The membership of the Combined Copper Committee, which will work in Washington, will be: Harry O. King, Jr., chairman; Robert R. Nathan, Combined Production and Resources Board; Lincoln Gordon, Combined Raw Materials Board; A. McDougall, Combined Raw Materials Board: M. I. Michaels, British Ministry of Supply Mission; George McDonald, representing the Metal Comptroller, Canada; Lt. Col. James Boyd, Services of Sup-

SEGREGATION AT THE SOURCE: At this Western Electric plant, receptacles for turnings of high speed steel, nickel silver, brass, copper and bronze are provided. An even better procedure would be to separate copper from bronze turnings. Only turnings of identical analysis should be kept together.



ply, United States Army, and Lt. Com. Paul F. Linz, United States Navy.

### **Detinning Plants Halted**

• • • The construction of new or enlarged facilities for tin recovery has been halted by WPB order. The H. K. Ferguson Co. which was granted the overall contract for the building of these plants has been told by Washington to cease activity on all but two of the plants under construction or being planned. The facilities that will be completed are expansions of two already existing plants of the Metal & Thermit Co. at Carteret, N. J., and East Chicago, Ind.

A detinning plant at Long Island City, N. Y., which was nearing completion was stopped as was a project started about two or three weeks ago in Chicago. Work started 10 days ago at Birmingham and operations that were to begin next week in Los Angeles were also stopped by the order. Expansion of the Vulcan Detinning Co. plant at Neville Island, Pa., was halted as well. Shredder plants not started yet are out.

### Domestic Manganese Used

• • • More than 100,000 lb. of metallic manganese, recovered from lowgrade domestic ores by an electrolytic method developed in Bureau of Mines laboratories, have been delivered to the Treasury Department for lendlease and to the United States mint as another tangible product of the Interior Department's program for freeing the United States from dependence upon foreign sources for this strategic mineral. Several shipments of 99.9 per cent pure manganese from the Boulder City pilot plant have been sent to branches of the mint at Philadelphia and San Francisco. Bureau metallurgists determined that several alloys using manganese possess the physical and chemical properties required as a substitute for the five-cent coin heretofore made of 75 per cent Cu and 25 per cent Ni. The new coin of 9 per cent Mn, 35 per cent Ag, and 56 per cent Cu closely approximates the old coin in hardness, appearance, and durability, and electrical resistance and is acceptable for use in coin-operated machines.

# Feb. 1 Deadline Cuts Stock Loss

• • • Manufacturers of primary magnesium alloys, except those who also produce the metal, may carry out contracts with government agencies at prices prevailing before Feb. 1 in order to avoid loss on inventories of the metal and its alloys that were on hand at that date, OPA announced Feb. 15.

The seller may deliver alloys at the price prevailing before OPA ordered the reduction of 2c. a lb. for primary magnesium metal and alloys until he has disposed of the alloy equivalent of his Feb. 1 inventory of magnesium.

### Collections to Continue

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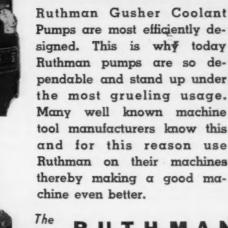
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• • • In commenting on the tin can collection, latest figures indicate that about 17,000 gross tons per month are being collected, but this is less than half of the capacity of detinning and shredding facilities now operating and less than 25 per cent of the cans discarded. A more expanded and vigorous collection of cans in the southwest area was urged to be used in the recovery of copper, by a precipitation process known as leaching. Cans are needed in large quantities to utilize the capacities of the shredders at Los Angeles, Kansas City, Dallas and Houston.

As to the rest of the country, can collection should be carried forth on the existing basis to utilize detinning capacity. The largest of detinners already in operation are at Pittsburgh, Pa., Carteret and Sewaren, N. J., East Chicago, Ind., Cleveland, Baltimore, and South San Francisco. Most of the equipment already fabricated for the new detinning plants can be used in other war manufacture, since little actual construction has been done beyond clearing sites for the plants.

In announcing this order, Donald M. Nelson said that postponement does not mean that either the tin or steel scrap supply has eased to the point where it is no longer a critical problem but rather that motors, boilers, tanks and other equipment used in such plants are urgently needed in other phases of the war effort.

# RUTHMAN



RUTHMAN MACHINERY COMPANY CINCINNATI, OHIO



Coolant PUMPS



Complete Facilities for WELDED, WOVEN OR FORMED Wire Products

Replace a scarce part with its equivalent in wire. Group other small parts for "unit handling" in wire baskets and save time and space. Handle groups of products right side up in position for inspection, sorting, spraying, etc. in special wire trays and racks. Redesign with wire for lighter weight, faster drying or cooling, economy of material, etc.

STEEL PRODU

UNION STEEL PRODUCTS COMPANY

442 Pine Street . Albion, Mich.

Fan Guards
Shelving & Grills

SHAPES: Forms, parts, etc. SHELVING: Refrigerators, Stoves, Cabinets

RACKS: Oven, Refrigerator, Display

BASKETS: Dipping, Display, Tote, Rubbish, Pickling, Heat Treating

CRATES: Bottle, Tote

GUARDS: Fan, Heater, Window

TRAYS: Package

BROILERS: Meat

GRIDS: Camp

CARRIERS: Bottle, Package POULTRY: Coops, Batteries SPACERS: Reinforcing Steel HANGERS and FORMS INSERTS

THE IRON AGE, February 18, 1943—141

# Mill Stocks Permit Buyers to Choose

• • • • A last minute survey of the scrap trade this week reveals a situation of comparatively satisfactory supply in most mills but of little activity in the yards. Extremely cold weather and some snow in eastern areas has slowed collections and yard preparation. While business is poor for the yard trade industrial scrap has been coming out at a good clip which has been mostly responsible for keeping the mills content. Allocations to St. Louis from outside areas are reported.

Mill supplies are sufficient again this week to keep turnings banned in many areas or moving slowly. Considerable attention is being directed at the moment to the problem of disposing of high nickel turnings, with high tungsten and moly turnings running a close second for slowness of movement. Allocations of carbon turnings are expected soon to clear away the supplies of these which are becoming a problem. Mills dislike to handle any large proportion of these due to charging difficulties and bulkiness. Yards are taking advantage of the premium on shoveling turnings by forking off the bushy turnings and mixing the short stubs in with shovelings. Mills have no objection to this yard policy from the standpoint of integrity but after having been accustomed to cars being only partly bushy and partly shoveling size are irked at the new loadings of all bushy.

### WPB Urges Scrap Yard Men to Stay on Jobs

Washington

• • • WPB's Salvage Division issued a statement on Monday urging all workers in auto graveyards and scrap yards, since they are considered by the War Manpower Commission as employed in an essential activity, to remain on their jobs unless specifically instructed to the contrary by the local employment officers of WMC.

The statement said that the Division had received word from WMC indicating that under the general caption, "Smelting, Refining and Rolling

of Metals" in WMC Group No. 12, and also in Selective Service Occupational Bulletin No. 16, the scrap metal industry is considered essential to the war effort. It was added that those employees of the industry whose job classifications are among those in the List of Essential Occupations for Group No. 12 and Bulletin No. 16, are eligible for draft deferment.

### Three Suggestions Made To Reclaim Nickel Turnings

Pittsburgh

• • • Turnings of all kinds, with the possible exception of shoveling turnings, have been a drug on the market for some time, but more especially turnings that are high in nickel, tungsten or molybdenum. The question posed by nearly all dealers regarding how to move these grades which are being so plentifully produced now has brought forth a series of three suggestions from Edward Solomon of the Max Solomon Co., Pittsburgh.

These suggestions consist mainly of means of identifying the analysis so that turnings of these alloys can be classified and used safely for remelt purposes. The first method would require baling with a sheet iron or fender binder and drilling the bale for test samples. A refinement of this idea suggests crushing and briquetting before analysis. Both of these methods are dependent upon either crushing and briquetting equipment or baling presses all of which are either seriously limited in number or are confined in use by labor shortages and high operating costs.

Most likely of the suggestions consisted in having the government authorize certain properly equipped steel producers to set aside particular blast furnaces for remelting of alloy turnings exclusively. The pigs from these furnaces could then be accurately analyzed and sold at prices consistent with the amount of the particular alloy present. Steel users likewise could buy this iron with complete knowledge of its analysis and uniformity.

Most desirable feature of the ideas generally are that they show a way to greater conservation of the nation's stores of the virgin alloying elements by reclamation from scrap.

### OPA Drops 5c. Ton on Jersey Scrap Prices

Washington

• • • • A reduction of 5c. per gross ton in the maximum prices of steel scrap at shipping points in Hudson and Bergen counties of New Jersey was announced Feb. 11 by OPA.

The change is contained in amendment No. 11 to Revised Price Schedule No. 4 (Iron and Steel Scrap) which becomes effective Feb. 16.

Under the amendment, maximum shipping point prices at all shipping points in Hudson and Bergen counties must be computed from the Bethlehem, Pa., basing point.

PITTSBURGH—Despite severe weather conditions, the flow of scrap was satisfactory here early this week. This was due to better tonnages of industrial scrap, which has been reaching mills in fair quantities recently. Preparation at dealers yards was stymied temporarily by severe cold weather. There were no serious spots in the picture here this week.

BUFFALO—The trade was reported this week to be pondering a raise in wage rates for yard workers in a new effort to stem the steady dwindling away of manpower. Proprietors saw no relief in the government's order for a blanket 48-hr. work week in this industrial area as yards already are on an overtime basis. There is little trade activity. A small amount of short turnings and borings, recently banned by mill buyers, was moved.

BOSTON — Yards are not obtaining much scrap, but are taking all they can handle with the limited supply of labor. Shipments to mills are more frequent than a week ago, yet the trade generally reports business "still very quiet." Although accumulations in yards are not important despite freer collections from metal working shops, buyers and shippers of turnings report the situation still very much up in the air.

TORONTO—Scrap receipts by dealers and consumers are down to less than 50 per cent of requirements and a critical situation is developing in supply of iron scrap for foundries, while steel mills are facing a shortage of steel scrap for the closing weeks of winter. No deliveries of scrap are being received from the rural districts, still closed in with many feet of snow. Salvage campaigns also are at a standstill.

BIRMINGHAM — Availability of cast grades in this area has dealers in a quandary. The WPB is reported to be exerting pressure on the dealers to make shipments while foundries, with adequate

# Can Collection Is Problem of Schedule

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• • • Opposition to a proposal to collect tin cans every six weeks instead of fortnightly has been expressed by William E. Gleason, tin chairman of the Buffalo War Council's Salvage Committee. Because of sharp losses suffered by the city on each collection, agitation has developed for a six-week schedule.

Argues Gleason, "It doesn't seem right that we should be storing carloads of cans in cellars and on porches when our detinning plants are so desperately in need of supplies. I am informed by Vulcan Detinning Co., Pittsburgh, that only 35 per cent of the nation's equipment for detinning is in use."

supplies in hand, are doing little if any buying. Steel mills, with considerable inventories of various grades, are only purchasing to meet current consumption.

cINCINNATI — Problems of getting adequate labor in the district scrap yards is probably the chief problem of district dealers. In fact, in some instances it is reported that because of the shortage of labor they are having difficulty in moving accumulations of material obtained through recent scrap drives. Despite this, there is no particular stringency among district users, since apparently the supply moving, coupled with present short inventories, are adequate for present production rates.

NEW YORK — Bitter weather has brought work to a standstill. Dealers report that short shoveling turnings have been moving hardly at all. A slight improvement was reported in demand for alloy turnings, due principally to shipments made to a mill in the Pittsburgh area.

PHILADELPHIA—Shipments are greatly reduced on account of weather, and one dealer reports that two mills which had previously requested a slow-down of shipments have asked that they be stepped up. There is no demand whatever for short shoveling turnings, and very little for alloy grades.

ST. LOUIS—The shortage of manpower is becoming more and more acute and operations in scrap dealers' yards are only about 50 per cent of normal, because many workers have gone to war jobs at higher wages or have been drafted. The regional director of the War Manpower Commission and the regional salvage manager of the WPB issued a joint statement declaring such workers are in essential war industries and so eligible for draft deferment and urging them not to try to shift to war production plants.



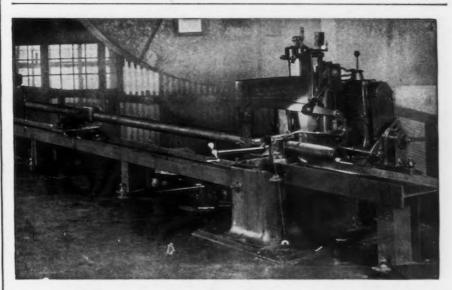
### ANY METAL . ANY PERFORATION

**Industrial**—Well balanced screens of excellent material and workmanship to assure maximum screen production combined with durability.

**Ornamental**—Approved patterns and finishes including many exclusive and characteristic designs for grilles and furniture. We invite your inquiries.

# Harrington & King

5657 FILLMORE STREET—CHICAGO, ILL. New York Office, 114 Liberty Street



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The most economical method of cutting-off identical pieces from bar steel is with a MARVEL Automatic Production Saw. It will give you more pieces per hour, per machine and per dollar cost than any other accurate cutting-off method. Figured in cost per piece, it will have the lowest labor cost, too, because MARVEL Automatic Saws operate with no more attention than an automatic screw machine. They keep chip loss down to a minimum and on many jobs will give you extra pieces per bar.

For cast automatic production or for single-cut miscellaneous work, MARVEL 6A or 9A Hack Saws are fast, accurate tools. Capacities 6" x 6" or 10" x 10", single or nested bars. Write today for Bulletin N. 600.



### ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People" 5700 Bloomingdale Ave. Chicago, U.S.A.

Eastern Sales Office: 225 Lafayette St., New York

22.50

20.00

19.00

\*Baled turnings are \$5 per gross ton higher.

BUNDLES: Tin can bundles are \$4 below dealers' No. 2 bundles No. 3 bundles are \$2 less than No. 1 heavy melting.

17.50

AT NEW YORK city or Brooklyn, the maximum shipping point price is \$15.33 for No. 1 heavy meiting, f.o.b. cars, f.a.s. vessel or loaded on truck. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is \$15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of \$6.65 per ton.

SWITCHING CHARGES: Deductions for shipping points within bashing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati\*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenisville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshobocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. \*At Clincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Romestead, Duquesne, Munhall and McKeesport, Cincinnati basing point Includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco Includes switching districts of S. San Francisco, Niles and Oakland, Cal.

MAXIMUM prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1. 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or ressel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation

charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton\*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

19.00

19.50

18.50

20.00

15.50

17.00

18.50

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be \$3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made \$4) less the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

Maximum price of all scrap in a vehicle is that of the lowest price rade in the shipment. This limitation does not apply to vessel shipments if grades are segregated.

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed. For special preparation charges, consult official order.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), \$1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), \$2 less than No. 1 heavy melting. If loaded in box cars add 75c.

UNPREPARED CAST IRON SCRAP—Except for heavy breakable cast, unprepared scrap is given a price ceiling of \$2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller scertification, made out to OPA.

At Memphis 50c.; Great Lakes ports \$1; New England \$1.25.

	RAILF	ROAD SCI	RAP	S	crap Rail	8
	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth,						
Middletown	\$20.50	\$21.50	\$23,00	\$23.50	\$23.75	\$24.00
Canton, Pittsburgh	440.00	421100	000.00	020.00		
Sharon, Steubenville.						
Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia.						
Sparrows Pt., Wilmington	19.75	20.75	22, 25	22.75	23.00	23.25
Birmingham, Los Angeles,						
San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23,50	23.7
Detroit	18.85	19.85	21.35	21.85	22.10	22.3
Duluth	19.00	20.00	21.50	22.00	22.25	22.5
Kansas City, Mo	17.00	18.00	19.50	20.00	20.25	20.5
Kokomo, Ind	19.25	20.25	21.75	22.25	22,50	22.7
Seattle	15.50	16.50	18.00	18.50	18.75	19.0
St. Louis	18.50	19.50	21.00	21.50	21.75	22.0

CAST IRON	N SCRAP		
No. 1 cupola cast	Group A \$18.00	Group B \$19.00	Group \$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	18.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

to A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas Oklahoma, Texas and Florida

Group C: States not named in A and B: switching district of Kansas City, Kan., Mo.

# . . . Comparison of Prices

				e; Declines	in Italics. [Prices Are F.O.B. Major Basing Points]
lat Rolled Steel: (Cents Per Lb.)	Feb. 16, 1943	Feb. 9, 1943	Jan. 19, I 1943	Feb. 17, 1942	Pig Iron: Feb. 16, Feb. 9, Jan. 19, Feb. (Per Gross Ton) 1943 1943 1943 194
lot rolled sheets	2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia. \$25.89 \$25.89 \$25.89 \$25.89
Cold rolled sheets	$3.05 \\ 3.50$	$\frac{3.05}{3.50}$	$\frac{3.05}{3.50}$	3.05 3.50	No. 2, Valley furnace 24.00 24.00 24.00 24.00
Hot rolled strip	2.10	2.10	2.10	2.10	No. 2, Southern Cin'ti 24.68 24.68 24.68 No. 2, Birmingham 20.38 20.38 20.38 20.38
Cold rolled strip	2.80	2.80	2.80	2.80	No. 2, foundry, Chicago† 24.00 24.00 24.00 24.00
PlatesPlates, wrought iron	$\frac{2.10}{3.80}$	$\frac{2.10}{3.80}$	$\frac{2.10}{3.80}$	2.10 3.80	Basic, del'd eastern Pa 25.39 25.39 25.39 25.89 Basic, Valley furnace 23.50 23.50 23.50 23.50
Stain's c.r. strip (No. 302)		28.00	28.00	28.00	Malleable, Chicago† 24.00 24.00 24.00 24.00
in and Terne Plate:					Malleable, Valley 24.00 24.00 24.00 24.00
(Dollars Per Base Box)					L. S. charcoal, Chicago 31.34 31.34 31.34 31.34 Ferromanganese‡ 135.00 135.00 135.00 120.0
Tin plate, standard cokes		\$5.00	\$5.00	\$5.00	†The switching charge for delivery to foundries in the C
Tin plate, electrolytic Special coated mfg. ternes		$\frac{4.50}{4.30}$	$\frac{4.50}{4.30}$	4.50 4.30	cago district is 60c. per ton. ‡For carlots at seaboard.
ars and Shapes:					
(Cents Per Lb.) Merchant bars	2.15	2.15	9.15	9.15	
Cold finished bars		2.65	2.15 $2.65$	2.15 2.65	Scrap:
Alloy bars		2.70	2.70	2.70	(Per Gross Ton) Heavy melting steel, P'gh. \$20.00 \$20.00 \$20.00 \$20.
Structural shapes Stainless bars (No. 302)		$\frac{2.10}{24.00}$	$\frac{2.10}{24.00}$	$\frac{2.10}{24.00}$	Heavy melt'ig steel, Phila. 18.75 18.75 18.75 18.
Wrough iron bars	4.40	4.40	4.40	4.40	Heavy melt'g steel, Ch'go 18.75 18.75 18.75 18. No. 1 hy. comp. sheet, Det. 17.85 17.85 17.85 17.85
ire and Wire Products:					Low phos. plate, Youngs'n 22.50 22.50 23.
(Cents Per Lb.)			4	0.43	No. 1 cast, Pittsburgh 20.00 20.00 20.00 20. No. 1 cast, Philadelphia. 20.00 20.00 20.00 20.
Plain wire		2.60 2.55	2.60 2.55	2.60 2.55	No. 1 cast, Ch'go 20.00 20.00 20.00 20.
ails:					
(Dollars Per Gross Ton)		040.00		***	Coke, Connellsville:
Heavy rails Light rails		\$40.00 40.00	\$40.00 40.00	\$40.00 40.00	(Per Net Ton at Oven)
emi-Finished Steel:					Furnace coke, prompt \$6.50 \$6.50 \$6.00 \$6. Foundry coke, prompt 6.875 6.875 6.875 6.875
(Dollars Per Gross Ton		204.00	*04.00	***	
Rerolling billets Sheet bars	34.00	\$34.00 34.00	\$34.00 34.00	\$34.00 34.00	
Slabs	34.00	34.00	34.00	34.00	Non-Ferrous Metals:
Forging billets		40.00 54.00	$\frac{40.00}{54.00}$	$40.00 \\ 54.00$	(Cents per Lb. to Large Buyers)
	0.1100	0 2100	02.00	04.00	Copper, electro., Conn 12.00 12.00 12.00 12 Copper, Lake, New York. 12.00 12.00 12.00 12
Wire Rods and Skelp: (Cents Per Lb.)					Tin (Straits), New York. 52.00 52.00 52.00 52
Wire rods	2.00	2.00	2.00	2.00	Zinc, East St. Louis 8.25 8.25 8.25 8 Lead, St. Louis 6.35 6.35 6.35 6
Skelp (grvd)	1.90	1.90	1.90	1.90	Antimony (Asiatic), N. Y. 16.50 16.50 16.50 16
The modern to the	s for fir	nished ar	nd semi-fi	nished steel	are listed in the detailed price tables, pages 147 to 150.
the various basing point			_		
	Pr	100	6		
Composite			<b>S</b> .		
Composite Feb. 16, 19432.3	STEEL 0467c. a	a Lb		• •	PIG IRON SCRAP STEEL 23.61 a Gross Ton. \$19.17 a Gross Ton.
Feb. 16, 1943	STEEL 0467c. a 0467c. a	a Lb		2	23.61 a Gross Ton \$19.17 a Gross Ton 23.61 a Gross Ton \$19.17 a Gross Ton
FINISHED  Seb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a	a Lb a Lb			23.61 a Gross Ton \$19.17 a Gross Ton
FINISHED  Seb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a	a Lb a Lb a Lb LO	 w	HIG	23.61 a Gross Ton.       \$19.17 a Gross Ton.         24.61 a Gross Ton.       \$19.17 a Gross Ton.         25.61 a Gross Ton.       \$19.17 a Gross Ton.         26.61 a Gross Ton.       \$19.17 a Gross Ton.
FINISHED Feb. 16, 1943 2.3 One week ago 2.3 One year ago 2.3 HIGH 2.30467c. 1942 2.30467c.	STEEL 0467c. a 0467c. a 0467c. a 0467c. a	a Lb a Lb a Lb a Lb	 W 67c.,		23.61 a Gross Ton.       \$19.17 a Gross Ton.         24.61 b Gross Ton.       \$19.17 a Gross Ton.         25.61 a Gross Ton.       \$19.17 a Gross Ton.         26.7 a Gross Ton.       \$19.17 a Gross Ton.         27.7 a Gross Ton.       \$19.17 a Gross Ton.         28.61 a Gross Ton.       \$19.17 a Gross Ton.
Finished Fib. 16, 1943 2.3 One week ago 2.3 One year ago 2.3 One year ago	STEEL 0467c. a 0467c. a 0467c. a	Lb Lb Lb Lb LO 2.304 2.304 2.304	W 67c., 67c.,	HIG \$23. 23. \$23.61, M	23.61 a Gross Ton.     \$19.17 a Gross Ton.       24.61 a Gross Ton.     \$19.17 a Gross Ton.       25.61 a Gross Ton.     \$19.17 a Gross Ton.       26.7 a Gross Ton.     \$19.17 a Gross Ton.       27.6 a Gross Ton.     \$19.17 a Gross Ton.       28.6 a Gross Ton.     \$19.17 a Gross Ton.       29.6 a Gross Ton.     \$19.17 a Gross Ton.       29.6 a Gross Ton.     \$1
FINISHED  Seb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a	LO 2.304 2.304 2.304 2.4107c.,	W 67c., 67c., 67c.,	HIG \$23. 23. \$23.61, M 23.45, D	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. 2 0467c. 2 0467c. 2 0	Lb Lb Lb Lb LO 2.304 2.304 2.304 2.304 2.24107c., 26689c., 27207c.,	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18	HIG \$23. 23. \$23.45, I 22.61, S 23.25, J	23.61 a Gross Ton
FINISHED Feb. 16, 1943 2.3 One week ago 2.3 One year ago 2.3 One year ago 2.3 HIGH 1943 2.30467c. 1941 2.30467c. 1940 2.30467c. 1940 2.30467c. 1939 2.35367c., Jan 1939 2.58414c., Jan 1937 2.58414c., Ma	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lb a Lb a Lb LO 2.304 2.304 2.4107c., .26689c., .27207c., .32263c.,	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4	#HIG \$23, 23, \$23.61, E 22.61, S 23.25, J 23.25, M	23.61 a Gross Ton
Finished Fib. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lb a Lb a Lb LO 2.304 2.304 2.4107c., .26689c., .27207c., .32263c.,	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10	HIG \$23. 23. \$23.45, I 22.61, S 23.25, J	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lb Lb Lb LO 2.304 2.304 2.304 2.304 2.24107c., 26689c., 27207c., 32263c., 05200c., 06492c., 95757c.,	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2	#HIG \$23. \$23.61, M 23.45, L 22.61, S 23.25, J 23.25, J 19.74, N 18.84, N 17.90, M	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0 04	Lb Lb Lb Lo 2.304 2.304 2.304 2.24107c., 2.26689c., 2.7207c., 32263c., 05200c., 95757c., 75836c.,	W 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2 May 2	#HIG \$23. \$23.61, M 23.45, L 22.61, S 23.25, J 23.25, J 19.74, N 17.90, M 16.90, L	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 2 2. n. 3 2 2. n. 4 2 2. n. 1 2 2. c. 28 2. t. 1 2 r. 24 1 t. 3 1 ly 5 1 n. 13 1 ln. 13	Lb	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2 May 2 May 2 May 1	HIG \$23. \$23.45, I 22.61, S 23.25, J 23.25, J 19.74, N 18.84, N 17.90, M 14.81, J 15.90, J	3.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 2 2. n. 3 2 n. 4 2 2 nr. 9 2 cc. 28 2 2 d. 1 2 3 1 d. 3 1 d. 5 1 n. 7 1 n.	Lb	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2 May 2 Mar. 1 Dec. 29 Dec. 9	HIG \$23. \$23.45, I 22.61, S 23.25, J 23.25, J 19.74, N 18.84, N 17.90, M 16.90, I 14.81, J 15.90, J 18.21, J	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0 04	Lb	W 67c., 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2 May 2 Mar. 1 Dec. 29 Oct. 29	HIG \$23. \$23.45, I 22.61, S 23.25, J 23.25, J 19.74, N 18.84, N 17.90, M 14.81, J 15.90, J	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 2 2. n. 3 2 2. n. 3 2 2. n. 4 2 2. r. 24 1 t. 3 1 ly 25 1 n. 13 1 ln. 7 1 ly 28 2 2 ls. tank s tank s	Lb	W 67c., 67c., 67c., 67c., 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 8 Jan. 2 May 2 May 2 May 2 Oct. 29 Oct. 29 On steel ire, rails,	HIG \$23. \$23.61, M 23.45, I 22.61, S 23.25, M 19.74, N 18.84, M 17.90, I 14.81, J 15.90, J 18.21, J 18.71, M	23.61 a Gross Ton
FINISHED Feb. 16, 1943	STEEL 0467c. a 0467c. a 0467c. a 0467c. a 0467c. a 1 0467c. a 1 0467c. a 1 0467c. a 1 047c. a 1	Lb Lo 2.304 2.304 2.24107c., 2.26689c., 2.7207c., 32263c., 0.6492c., 9.5757c., 75836c., 83901c., 86586c., 97319c., based plates, w cold-roll ing 78 pe	W 67c., 67c., Apr. 16 May 16 Oct. 18 Jan. 4 Mar. 10 Jan. 2 May 2 May 2 Mar. 1 Dec. 29 Oct. 29 on steelire, rails, ed sheets	HIG \$23. \$23.61, M 23.45, I 22.61, S 23.25, M 19.74, N 18.84, M 17.90, I 14.81, J 15.90, J 18.21, J 18.71, M Based at Valley at Chica	23.61 a Gross Ton

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# **Prices of Finished Iron and Steel...**

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point												10	DELI	VEREI	то
Product	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
SHEETS Hot rolled	2.10∉	2.10¢	2.10¢	2.10¢	2.10∉	2.10 ≰	2.10∉	2.10¢	2.20∉	2.10€		2.65∉	2.22∉	2.35¢	2.28∉
Cold rolled <sup>1</sup>	3.05€	3.05€	3.05€	3.05€		3.05€	3.05∉		3.15∉	3.05≰		3.70∉	3.17¢	3.41∉	3.39¢
Galvanized (24 ga.)	3.50€	3.50∉	3.50€		3.50€	3.50€	3.50€	3.50€	3.60€	3.50€		4.05∉		3.75€	3.68∉
Enameling (20 ga.)	3.35€	3.35€	3.35€	3.35∉			3.35∉		3.45€	3.35∉		4.00¢	3.47 €	3.73¢	3.69 €
Long ternes <sup>2</sup>	3.80€		3.80€								-	4.55€		4.18#	4.14¢
STRIP Hot rolled*	2.10€	2.10∉	2.10¢	2.10∉	2.10¢		2.10∉			2.10∉		2.75∉	2.22¢	2.48#	
Cold rolled*	2.80€	2.90∉		2.80€			2.80∉	(Wo	rcester =	3.00≰)			2.92¢	3.18∉	
Cooperage stock	2.20¢	2.20€			2.20€		2.20€							2.58∉	
Commodity C-R	2.95€			2.95€			2,95€	(Wor	cester =	3.35€)			3.07 6	3.33∉	
TIN MILL PRODUCTS Coke tin plate, base box	\$5.00	\$5.00	\$5.00						\$5.10					5.38∉	5.34
Electrolytic tin plate, box	\$4.50		\$4.50												
Black plate, 29 gage <sup>5</sup>	3.05€	3.05€	3.05€						3.15€			4.05¢12			3.39
Mfg. ternes, special box	\$4.30	\$4.30	\$4.30						\$4.40						
BARS Carbon steel	2.15¢	2.15€	2.15¢	2.15¢	2.15∉	2.15∉		(Du	lluth = 2.	25¢)	2.52€	2.80€	2.27∉	2.51¢	2.49
Rail steel <sup>6</sup>	2.15€	2.15∉	2.15¢	2.15∉	2.15¢	2.15€					2.52€	2.80€			
Reinforcing (billet)7	2.15∉	2.15¢	2.15¢	2.15¢	2.15€	2.15¢	2.15€	2.15€			2.52€	2.55€13	2.27 €	2.40¢	
Reinforcing (rail)7	2.15€	2.15∉	2.15€	2.15€	2:15∉	2.15¢	2.15∉				2.52€	2.55¢13	2.27 €		2.49
Cold finished®	2.65€	2.65∉	2.65#	2.65€		2.65¢			(Detroi	t = 2.70e				3.01∉	2.99
Alloy, hot rolled	2.70¢	2.70e				2.70¢	P	ethleher	n, Massil	lon, Can	ton = 2.7	0e)	2.82€		
Alloy, cold drawn	3.35€	3.25 €	3.35€	3.35€		3.35€							3.47 €		
PLATES Carbon steel	2.104	2.10é	2.10é	2.10¢	2.10€		2.104		tesville	and Clay		2.10¢)	2.33 €	2.30€	2.15
Floor plates	3.35€	-		-			-	-	-		3.72€	-		3.73∉	3.69
Alloy	3.50€	-		-	(Coat	esville =	3.50é)	-		-	3.97 €	4.15¢	-	3.716	3.60
SHAPES Structural	2.10¢		2.10€		2.10∉	2.10¢		Bethleh	em = 2.10	-  0¢)	2.47€	2.75€		2.28¢	2.22
SPRING STEEL, C-R 0.26 to 0.50 Carbon	2.80€			2.80∉			(Wo	cester =	3.00∮)						
0.51 to 0.75 Carbon	4.30€			4.30€			(Wo	rcester =	4.50¢)						
0.76 to 1.00 Carbon	6.15€			6.15¢			(Wo	rcester =	6.35€)						
1.01 to 1.25 Carbon	8.35¢			8.35∉			(Wo	rcester =	8.55¢)						
WIRE® Bright <sup>18</sup>	2.60€	2.60€		2.60¢	2.60¢		(Wo	rcester =	2.70c)			3.10€			2.94
Galvanized		1	1	1	add pro	per size	extra and	i galvan	ized extr	a to brigh	ht wire b	ase, abov	7e.	1	-1
Spring (High Carbon)	3.20€	3.20€		3.20∉			(Wo	rcester =	3.30€)			3.70€			3.54
PILING Steel sheet	2.40¢	2.40¢				2.40						2.95€			2.74

<sup>&</sup>lt;sup>1</sup> Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>8</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>8</sup> Applies to certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. <sup>8</sup> Also shafting. For quantities of 20,000 to 39,999 lb. <sup>9</sup> Carload lot to manufacturing trade. <sup>10</sup> These prices do not apply if the customary means of transportation (rail and water) are not used. <sup>12</sup> Ship plates only. <sup>13</sup> Boxed. <sup>13</sup> Portland and Seattle price, San Francisco price is 2.50c. <sup>14</sup> This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs ware-house prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6 Control of the customary means of transportation (rail and prices) and the customary means of transportation (rail and prices) and the customary means of transportation (rail and water) are not used. This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERMENT CEILINGS—Frice Schedule No. 5 Issued April 16, 1941, governs steel mill prices; Price Schedule No. 47 governs ware house prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c., at established basing points; Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., fo.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., fo.b. mill, and Central Iron & Steel Co. may quote 2.30c., fo.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follanshee Steel Corp. may sell forging billets at \$49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at \$34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at \$43 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at \$50 at established basing points and slabs at \$41; Empire Sheet and Tin Plate may sell slabs at \$41 at established basing points and sheet bars at \$39 f.o.b. mill: on lend-lease sales Northwestern Steel & Wire Co. may charge \$41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Copp. may charge \$36 per ton for sheet bars f.o.b. Portsmouth: Laclede Steel Co. on semifinish

### SEMI-FINISHED STEEL

For exceptions, see preceding page

### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.25 higher; f.o.b. Duluth, billets only, \$2 higher. Delivered prices do not reflect new per cent tax on freight rates.

			1 61	Crr c	MO T CE
Rerolling					\$34.00
Forging quality					40.00
Alloy Steel: Pi					
Canton, Mass					
Bethlehem, per	r gross	ton			\$54.00

### Shell Steel

														Z	-6	T	- 1	x	$r_0$	133	I	on
3	in.	to	12	in.													*		*	\$5	2.	00
12	in.	to	18	in.												*				-	4.	00
18	in.	an	d o	ver																5	6.	00
	Bas	ic	ope	en	h	e	aı	rt	h		S	h	el	1		S	te	96	al,	1	6.0	.b.
Pi	ttsb	urg	h,	Chi	ca	g	0	,	B	u	ff	a	10	),	(	3	2.1	r:	7.	C	es	re-
lai	nd,	You	ing	sto	WI	n	8	in	d	1	B	iı	rr	n	in	g	h	18	m	1.		
	Pric	es	d	eliv	er	e	d		1	0	ef	r	0	it			a	r	е		12.	25
hig	gher																					

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

*****					E	,	199	r	40	38	T	041
Open	hearth	or	bessemer									

### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md. Grooved, universal and sheared .. 1.90c.

Wire Rods	(N	0.	-63		te	)	9	1	3	9	i	21	. 1	,			
																	Per Lb.
Pittsburgh,	Ch	ic	a	g	0.		C	1	e'	V	eÌ	a	n	d			2.00c
Worcester,	Ma	SS															2.10c.
Birminghan	1 .				*	•	-									*	2.00c.
San Franci																	
Galveston .																Ü	2 25c

9/32 in. to 47/64 in., 0.15c. a lb. high-r. Quantity extras apply.

### TOOL STEEL

( 8	.o.b.	Pittsbi	urg	7 h	١,		B	e	t	h	1	e	h	e	n	ı,		2	Sy	17	0	16	: ELL	se)	
																	E	3	1.5	36	,	p	er	lb.	
		peed																							
St	raigh	t moly	bd	e	n	u	n	1		0		0		0	0					0.			5	4c.	
Tu	ingst	en-moly	be	ie	n	U	ır	n									0					5	73	2 C.	
H	gh-ca	arbon-c	hr	01	m	i	u	n	1														4	3c.	
Oi	l har	dening																					2	4c.	
Sp	ecial	carbor	1 .																				2	22c.	
E	tra .	carbon																					1	8c.	
Re	egula	r carbo	n	*							*												1	4c.	

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

### CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

### Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	 . 21.25c.	20.40c.
Bars	 .25.00c.	24.00c.
Plates	 . 29.00c.	27.00c.
Structural shapes	 . 25.00c.	24.00c.
Sheets	 .36.00c.	34.00c.
Hot rolled strip	 .23.50c.	21.50c.
Cold rolled strip	 . 30.00c.	28.00c.
Drawn wire	 .25.00c.	24.00c.

### Straight-Chromium Alloys

ll-id ng

-	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	.18.50c.	19.00c.	22.50c.	27,50c.
Plates .	.21.50c.	22.00c.	25.50c.	30,50c.
Sheets .	.26,50c.	29.00c.	32.50c.	36,50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st	. 22.00c.	22.50c.	32.00c.	52.00c.

### Chromium-Nickel Clad Steel (20%)

	 -	 -	-	-		-	-	-	•	_	-	 ***	-	 ~	~		1.7
Plates Sheets																	No. 304 18.00c.* 19.00c.

<sup>\*</sup>Includes annealing and pickling.

### NATIONAL EMERGENCY STEELS (Hot Rolled)

**Extras for Alloy Content** 

		CHEMI	CAL CO	MPOS	SITION LI	MITS, PEF	CENT			asic Hearth		nace
Designa- tion	Carbon	Man- ganese	Phos- phorus Max.	Sul- phur Max.	Siticon	Chro- mium	Nickel	Molyb- denum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets Bloom and Slabs
NE 1330 NE 1335 NE 1340 NE 1345 NE 1350	.28/ .33 .33/ .38 .38/ .43 .43/ .48 .48/ .53	1.60/1.90 1.60/1.90 1.60/1.90 1.60/1.90 1.60/1.90	.040 .040 .040 .040	.040 .040 .040 .040		********			.10	\$2.00 2.00 2.00 2.00 2.00 2.00		
NE 8020	.18/ .23	1.00/1.30	.040	.040	.20/ .35			.10/ .20	.45	9.00	.95c	\$19.00
NE 8442°	.40/ .45	1.30/1.60	.040	.040	.20/ .35			.30/ .40	.90	18.00	1.40	28.00
NE 8613 NE 8615 NE 8617 NE 8620 NE 8630 NE 8635 NE 8637 NE 8640 NE 8642 NE 8645 NE 8645 NE 8650	.12/ .17 .13/ .18 .15/ .20 .18/ .23 .28/ .33 .33/ .38 .35/ .40 .38/ .43 .40/ .45 .43/ .48 .48/ .53	.70/ .90 .70/ .90 .70/ .90 .70/ .90 .70/ .90 .75/1.00 .75/1.00 .75/1.00 .75/1.00	.040 .040 .040 .040 .040 .040 .040 .040	.040 .040 .040 .040 .040 .040 .040 .040	.20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35 .20/ .35	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70 .40/ .70	.15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25 .15/ .25	.75 .75 .75 .75 .75 .75 .75 .75 .75	15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00 15.00	1.25 1.25 1.25 1.25 1.25 1.25 1.25 1.25	25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00 25.00
NE 8729	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	20/ 30	.80	16.00	1.30	26.00
NE 9255 NE 9260 NE 9262	.50/ .60 .55/ .65 .55/ .65	.70/ .95 .75/1.00 .75/1.00	.040 .040 .040	.040 .040 .040	1.80/2.20 1.80/2.29 1.80/2.20	.20/ .40			.40c .40 .65	8.00 8.00 13.00		
NE 9415 NE 9420 NE 9422 NE 9430 NE 9435 NE 9437 NE 9440 NE 9442 NE 9445 NE 9450	.13/ .18 .18/ .23 .20/ .25 .28/ .33 .33/ .38 .35/ .40 .38/ .43 .49/ .45 .43/ .48 .48/ .53	.80/1.10 .80/1.10 .80/1.10 .90/1.20 .90/1.20 .90/1.20 .90/1.20 1.00/1.30 1.00/1.30	.040 .040 .040 .040 .040 .040 .040 .040	.040 .040 .040 .040 .040 .040 .040 .040	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.20/ .40 .20/ .40 .20/ .40 .20/ .40 .20/ .40 .20/ .40 .20/ .40 .20/ .40 .20/ .40	.20/ .50 .20/ .50 .20/ .50 .20/ .50 .20/ .50 .20/ .50 .20/ .50 .20/ .50 .20/ .50	.08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15 .08/ .15	.80 .80 .80 .80 .80 .80 .80 .85 .85	16.00 16.00 16.00 16.00 16.00 16.00 17.00 17.00 17.00	1.30e 1.30 1.30 1.30 1.30 1.30 1.30 1.35 1.35	\$26.00 26.00 26.00 26.00 26.00 26.00 27.00 27.00
NE 9537* NE 9540* NE 9542* NE 9550*	.35/ .40 .38/ .43 .40/ .45 .48/ .53	1.20/1.50 1.20/1.50 1.20/1.50 1.20/1.50	.040 .040 .040 .040	.040 .040 .040 .040	.40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .70 .40/ .70 .40/ .70 .40/ .70	.15/ .25 .15/ .25 .15/ .25 .15/ .25	1.20 1.20 1.20 1.20	24.00 24.00 24.00 24.00	1.70 1.70 1.70 1.70	34.00 34.00 34.00 34.00
NE 9630 NE 9635 NE 9637 NE 9640 NE 9642 NE 9645 NE 9650	.28/ .33 .33/ .38 35/ .40 .38/ .43 .40/ .45 .43/ .48 .48/ .53	1.20/1.50 1.20/1.50 1.20/1.50 1.20/1.50 1.30/1.60 1.30/1.60	.040 .048 .049 .040 .040 .040	.040 .040 .040 .040 .040 .040 .049	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60	.40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60 .40/ .60			.80 .80 .85	16.00 16.00 16.00 16.00 17.00 17.00	1.30 1.30 1.30 1.30 1.35 1.35	26.00 26.00 26.00 26.00 27.00 27.00 27.00

Recommended for large sections only.

Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished.

### **ELECTRICAL SHEETS**

(B	a	3	e,	,	f	. 6	).	ь.		1	0	it	t	3	61	u	r	g	h	)		F	er Lb.
Field grade	,																						3.20c.
Armature .				à				*	×			*			*		×		è		*		3.55c.
Electrical .						,				*													4.05c.
Motor																							4.95c.
Dynamo						×		*	*				•							*	*		5.65c.
Transforme	r		7	2								*		×		*							6.15c.
Transforme																						*	
Transforme																				*	*		
Transforme	r		5	2			,							*	*	,			*				8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

### WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base	per Keg
Standard wire nails		\$2.55
Coated nails		
Cutnails, carloads		
Bo		
Annealed fence wire		
Annealed galvanized fence v		
	Base	Column
Woven wire fence*		67
Fence posts (carloads)		69
Single loop bale ties		59
Galvanized barbed wiret		70
Twisted barbless wire		70

\*15½ gage and heavier. †On 80-rod spools in carload quantities.

### RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb.,

gross ton
(F.o.b. Basing Points) Per Gross Ton
Light rails (from billets)\$40.00
Light rails (from rail steel) 39.00
Base per Lb.
Cut spikes
Screw spikes
Tie plates, steel2.15c.
Tie plates, Pacific Coast2.30c.
Track bolts
Track bolts, heat treated, to rail-
roads
Track bolts, jobbers discount63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohlo, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

				1	20x14 in.	20x28 in
8-lb.	coating	I.C.			\$6.00	\$12.00
15-lb.	coating	I.C.			7.00	14.00
20-lb.	coating	I.C.			7.50	15.00

### BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)
Machine and Carriage Bolts:
Per Cent off List

## Per Cent off List

## In. & smaller x 6 in. & shorter. 65 %

9/16 & % in. x 6 in. & shorter. 63 %

4 to 1 in. x 6 in. & shorter. 61

1/8 in. and larger, all length. 59

All diameters over 6 in. long. 59

Lag, all sizes. 62

Plow bolts. 65

uts. Cold Purchase.

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	
7/16 in. and smaller		64
½ in. and smaller		
½ in. through 1 in		60
9/16 to 1 in	. 59	
11/8 in. through 11/2 in	. 57	58
1% in. and larger	. 56	

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71	and	10
In packages, with nuts attached			
In bulk			80
On stove bolts freight allow	red	up	to
65c. per 100 lb. based on Clevel	lan	d, C	hi-
cago, New York on lots of 200 ll	b. (	or ov	er.

Large Rivets (½ in. and larger)
Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham \$3.75

Cap and Set Screws Per Cent Off List

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima Delivered prices do not reflect new 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Maileable	Low Phos- phorus	Charcoal
loston††	\$25.53	\$25.03	\$26.53	\$26.03		
rookiyn	27.65			28.15		
ersey City	26.62	26.12	27.62	27.12		
hiladelphia	25.89	25,39	26.89	26.39		
	\$25.00	\$24.50	\$26.00	\$25.50		
verett. Mass. ††		24.50	26.00	25.50		*****
wedeland, Pa.		24.50	26.00	25.50		
teelton, Pa		24.50			\$29.50	*****
	25.00	24.50	26,00	25.50	29.50	
irdsboro, Pa	25.00	24.50	20.00	20.00		*****
			00.00	04.60	*****	*****
rie, Pa.		23.50	25.00	24.50	*****	
eville Island, Pa	24.00	23.50	24.50	24.00		*****
harpsville, Pa.º		23.50	24.50	24.00	11*11	*****
uffalo	24.00	23.00	25.00	24.50	29.50	****
incinnati	24.68	24.68		25.18	*****	
anton, Ohio	25.47	24.97	25.97	25.47		
lansfield, Ohio	26.06	25.56	26.56	26.06		
t. Louis	24.50	24.00				
hicago	24.00	23.50	24.50	24.00		\$31.3
ranite City, III.	24.00	23.50	24.50	24.00		
leveland	24.00	23.50	24.50	24.00		
lamilton, Ohio	24.00	23.50		24.00		
oledo	24.00	23.50	24.50	24.00		
		23.50	24.50	24.00		
oungstown*	24.00	23.50	24.50	24.00	*****	
etroit		23.50			*****	\$28.00
ake Superior fc	*****	*****	*****	*****	*****	
yles, Tenn. fc.†	*****	****	*****	*****	*****	33.00
t. Paul			27.26	26.76		****
uluth	24.50	24.00	25.00	24.50	*****	*****
irmingham	20.38	19.00	25.00	*****	*****	
os Angeles	27.25			*****		
an Francisco	27.25					
eattle.	00.00		1			
rovo, Utah	22.00	21.50				
fontreal.		27.50		28.00		*****
oronto	25.50	25.50		26.00		
Ololito	23.30	23.30		20.00	*****	*****

ha

\*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

\*\*Pittsburgh Ferromanganese Co. (Chester furnace only) may charge \$2.25 a ton over maximum healing point prices

mum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

†Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$1 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge \$30 for charcoal iron at its Delta. Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

### WAREHOUSE PRICES (Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

CITIES		SHEETS		S	TRIP			BA	RS		ALLO	BARS	
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled	Plates (1/4 in. and heavier)	Structural Shapes	Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh Chicago Cleveland Philadelphia New York Detroit Buffalo Boston Birmingham St. Louis St. Paul Milwaukee Baltimore Cincinnati Norfolk Washington Indianapolis Omaha Memphis New Orleans Houston Los Angeles † San Francisco †	\$3.35 3.25 3.35 3.58 3.58 3.43 3.71 3.45 3.50 3.50 3.42 3.50 3.42 3.85 3.85 3.85 3.85 3.85 3.85 3.85	\$4.00 4.10 4.05 4.602 4.301 4.68 4.78 4.242 4.35 4.232 5.00 4.372 4.50 5.10 4.77 4.66 4.95 5.43 7.15	\$4.75 4.851 4.62 4.90 4.841 4.754 6.11 4.751 4.981 5.05 4.981 5.05 5.15 5.25 5.25 5.25 5.25	\$3.60 3.50 3.95 3.95 3.43 3.82 4.06 3.70 3.85 3.73 4.00 3.67 4.10 4.10 4.10 4.20 4.30 4.90	\$3,20 3,50 3,20 3,31 3,51 3,45 3,46 3,61 3,83 3,54 3,45	\$3,40 3,55 3,40 3,56 3,60 3,60 3,80 3,80 3,80 3,80 3,80 4,05 3,80 4,05 3,90 4,15 3,90 5,25 4,90	\$3.40 3.55 3.58 3.75 3.65 3.85 3.85 3.86 3.80 3.80 3.70 3.80 4.05 3.80 4.05 3.80 4.05 3.90 5.25 4.60	\$3.35 3.50 3.25 3.84 3.43 3.35 3.50 3.75 3.85 3.65 3.65 3.95 3.95 3.95 3.95 3.95 3.95 3.95	\$3.65 3.75 4.09 3.80 3.75 4.13 4.43 4.02 4.34 4.04 4.15 4.03 3.97 4.42 4.31 4.60 4.50 5.70	\$7.45 7.36 7.55 7.31 7.60 7.67 7.35 7.77 7.72 7.45 7.58 7.69	\$5.75 5.65 5.85 5.86 5.90 5.97 5.65 6.07 6.02 6.00 5.88 5.99	\$8.40 8.40 8.56 8.84 8.70 8.40 8.91 8.77 8.84 8.63 8.50	\$6.75 6.75 6.75 7.18 7.19 7.05 6.75 7.26 7.12 7.44 6.98 7.10

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: 1500 to 1499 lb. 2400 to 1499 lb. 450 to 1499 lb. 51000 to 1999 lb. 0 to 1999 lb. 7300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb and over, hot rolled sheets, 400 to 1999 lb. galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles. hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.: galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.
† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

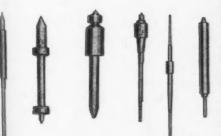
# EE Chillomatics

Here are a few pieces we have made from bar stock in ONE operation

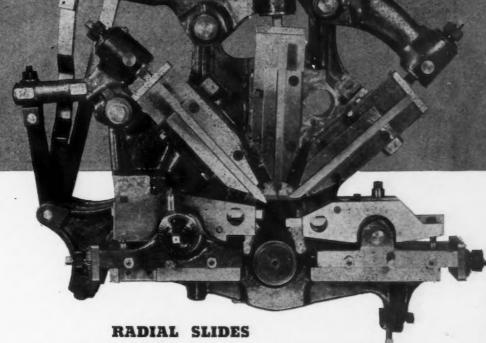








ons: nized and alloy tity,



This universal, Swiss Type, precision machine uses very simple and very inexpensive standard tool bits in place of the conventional indexing turrets, box tools and form tools. These tool bits turn and face the work as the revolving bar stock is being fed forward through the work guide bushing just back of the bits. This guide bushing does the work of the steady rest on a tool room engine lathe, assuring concentricity. \* The bits are advanced radially to the work and are receded when not in use by means of flat cams mounted on a single camshaft located at the back of the machine. \* Accuracy of diameters and lengths of shoulders are maintained by means of double micrometer adjustments. Odd shapes, such as radii, complicated forms, and tapers, can be produced by generating the flat cams mounted on the camshaft. Drilling, reaming, counterboring, tapping, threading, etc., are accomplished by attachments mounted on end of machine.



4 SLIDE — Above machine has four radial tool slides with bar capacity of ¾" diameter and α turning length of 1½" with flat cam and 2¾" with bell cam, and infinitely variable spindle speeds ranging from 675 to 6100.



**SLIDE** — Above machine has five radial tool slides with bar capacity of either %" or  $\frac{1}{2}$ " with a turning length of 4" with flat cam, and infinitely variable spindle speeds ranging from 755-7500.

HE CITY ENGINEERING CO. Dayton, Ohio

### **BOILER TUBES**

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes Minimum Wall (Net base prices per 100 ft. f.o.b. Pitts-burgh, in carload lots)

					Sea	mless	Weld.
						Hot Rolled	Hot Rolled
2 1/2 3 3 1/2	in. in. in.	o.d. o.d. o.d.	12 12 11	B.W.G. B.W.G. B.W.G. B.W.G.	20.21 22.48 28.37	17.54 19.50 24.62	16.58 18.35
				1			42 X

(Ex	tras	10	r I	ess	carloa	d a	uan	titie	(89
					er				
30,000	lb.	or	ft.	to	39,999	lb.	or i	ft.	5 %
20,000	lb.	or	ft.	to	29,999	lb.	or	ft.	10%
10,000	lb.	or	ft.	to	19,999	lb.	or	ft.	20%
5,000	lb.	or	ft.	to	9,999	lb.	or	ft.	30%
2,000	lb.	or	ft.	to	4,999	lb.	or	ft.	45%
Under	2.0	00	lb.	or	ft				65%

### CAST IRON WATER PIPE

					Pe	rNe	t Ton
6-in.	and	larger.	del'd	Chica	ago		54.80
6-in.	and	larger,	del'd	New	York		52.20
6-in.	and	larger,	Birm	ingha	m		46.00
		d large					
Fr	ancia	sco or	Los A	ngele	S		69.40
		larger					

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago. \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

### WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills (F.o.b. Pittsburgh only on wrought pipe) Base Price—\$200 per Net Ton

### Steel (Butt Weld)

Steel (Butt Weld)		
	Black	Galv.
½ in	63 1/2	51
% in	66 1/2	55
1 to 3 in	68 1/2	571/2
17	**	
Wrought Iron (Butt Well	d)	
½ in	25	3 1/2
% in	30	10
1 and 11/4 in	34	16
1½ in	38	1814
2 in	371/2	18
Steel (Lap Weld)		
2 in	61	491/2
2½ and 3 in	64	52 1/2
3½ to 6 in	66	54 1/2
Wrought Iron (Lap Weld	7)	
2 in	301/2	12
2½ to 3½ in	311/2	1416
4 in		
4 in	33 1/2	18

Steel	(Butt,	extra	strong,	plain Black	ends,
½ in				611/2	50 %
	in		*****	65 1/2	543
	ight Ire				

Steel	(La	p,	e:	x £1	ra	8	tr	0	ng	, plain	ends)
½ in. ¾ in. 1 to 2	in.	* *	* *	* *			٠.			. 38	19 1/4
% in.										. 31	12
1/2 in.										. 25	6
Wroup	ght	Ir	on	1	3	a	m	9	as	Above	2)

Wr	ough	t Iron	S	an	22.4	p	as	Ahone)	
3 1/2	to 6	in	 ٠.	-				66 1/2	56
2 1/2	and	3 in.	 					63	52 1/2
2 i	n		 	(e )				59	481/2

Wre	oug	h	Ir	0	n	L	-	(	S	a	n	121	e	a	8	Above)	
													*			331/2	15 1/22 1/2
4 1/2	to	6	in.						* ×							371/2	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card. F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

	New					
Balt	imore,	Mobile	e or	New	Or-	
lean	s, Dom	estic, 8	0%.	per g	ross	
ton	(carlos	ids) .				\$135.00

Spiegereis				Pe	27	(	7	9"	0	84	3	7	0	17	ı	F	urnace
Domestic,																	
Domestic,	26	to	28	%					0		0	0			٠		. 49.50

ì	Liect	ric rerrosilicon
ı	(Per	Gross Ton, Delivered Lump Size
ı	50%	(carload lots, bulk)\$74.50
Į		(ton lots, packed) 87.00
		(carload lots, bulk)135.00
l	75%	(ton lots, packed)151.00

### Silvery Iron

ı	(Per Gross Ton, base 6.00 to 6.50 Si
ı	F.o.b. Jackson, Ohio\$29.50
ı	Buffalo 30.75
ı	For each additional 0.50% silicon add
l	\$1 a ton. For each 0.50% manganese ove
l	1% add 50c. a ton. Add \$1 a ton fo
l	0.75% phosphorus or over.
ı	*Official OPA price established Jun

### Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

(Per	Lb., lots.	L	0	n	to	a	in	31	e e	d e		C	91	2 18		C	0	n	11	20	e1 a	C	80	1	C	ar
4 to	6 car	bo	n																					1	3.0	00
2 ca	rbon											×		*		*	*			,				1	9.5	00
1 ca	rbon			×	*			×	×				*							,				2	0.5	00
0.10	carbo	n		×						×	*	*	*		*	*		×		*	*	*		2	2.5	00
0.06	carbo	n			*				*		*	,			*	*	*				*			2	3.0	100
-	-																									

Spot prices are 1/4 c. per lb. of contained chromium higher.

### Ferroalloys

Sinco-			
(Per	Gross	Delivered,	Carload
3 carb	on		\$120.

							14										
3	carbon			0							0	0	۰			. !	\$120.00
2.	50 carbo	n															125.00
2	carbon								*						*		130.00
1	carbon			*					*	*			*			*	140.00

EBF

Other Ferroalloys	
Ferrotungsten, per lb. contained W, del'd carload	
W, del'd carload	\$2.00
Ferrotungsten, 100 lb. and less	2.25
Ferrovanadium, contract, per lb. contained V, del'd\$2.70 to	\$2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y.,	€9 9E+
ton lots	40.001
7-8 C, f.o.b. furnace, carload	
contract, net ton	142.50
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload	
contract, net ton	157.50
Ferrophosphorus, electric or blast	
furnace materials, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equaled	
with Rockdale, Tenn., gross ton.	\$58.50
Ferrophosphorus, electrolytic 23- 26%, carlots, f.o.b. Monsanto	*
(Siglo), Tenn., \$3 unitage,	
freight equalized with Nashville,	
gross ton	\$75.00
Ferromolybdenum, per lb., Mo,	*
f.o.b. furnace	95c.
	90C.
Calcium molybdate, per lb. Mo,	80c.
f.o.b. furnace	auc.
Molybdenum oxide briquettes 48-	
52 Mo, per lb. contained Mo,	
f.o.b. Langeloth, Pa.	80c.
Molybdenum oxide, in cans, per lb.	
contained Mo, f.o.b. Langeloth,	
and Washington, Pa	80c.

\*Spot prices are \$5 per ton higher. †Spot prices are 10c. per lb. of contained element higher.

### LAKE SUPERIOR ORES

(51.50% Fe., Natural Content, Delivered Lower Lake Ports) Der Gross Ton

Old	rang	e,	besser	ner,	51	.5	0					. \$	4.75
Old	rang	e.	non-b	esser	nei	,	5	1.	50	1			4.60
Mes	aba,	bes	semer	, 51.	50	0						۰	4.60
Mes	aba,	no	n-bess	emei	, 5	1.	50	)					4.45
High	h pho	osp	horus,	51.5	0								4.35

### COKE

Furnace		Per	Net Ton
†Connellsville,	prompt		
Foundry			

T Comment		
<b>TConnellsvill</b>	e, prompt\$6.75 to \$7.0	1
By-product,	Chicago\$12.2	
By-product,	New England \$13.7	į
By-product,	Newark\$12.40 to \$12.9	
By-product,	Philadelphia\$12.3	
By-product,	Cleveland\$12.3	
By-product,	Cincinnati\$11.7	
By-product,	Birmingham\$8.50	
	St. Louis\$12.0	
By-product.	Buffalo\$12.5	
Maximum	by-product coke prices es	

tablished by OPA became effective Oct. tablished by OPA became effective Oct. 1, 1941.

\*Hand-drawn ovens using trucked coal are permitted to charge \$7.00 per net ton, plus usual transportation. Maximum beelive furnace coke prices established by OPA, Feb. 8, 1942. †F.O.B. oven.
Ceiling for operators of hand drawn ovens using trucked coal is \$6.50.

### FLUORSPAR

Per Net To	m
Domestic washed gravel, 85-5 f.o.b.	
Kentucky and Illinois mines, all	
rail\$25.0	00
Domestic, f.o.b. Ohio River landing	
barges 25.	00
No. 2 lump, 85-5 f.o.b. Kentucky	
and Illinois mines 25.	00

### REFRACTORIES

(F.o.b. Works)

Fire Clay Brick Per	1000
Super-duty brick, St. Louis	64.60
First quality, Penna., Md., Ky., Mo.	
& Ill	51.30
First quality, New Jersey	56.00
Second quality, Penna., Md., Ky.,	
Mo. & Ill	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60

### Silian Briok

Juica Ditch									
Pennsylvania	&	B	irmi	ngha	m				 \$51.30
Chicago Distr	ict								 58.90
Silica cement	n	et	ton	(Ea	ste	er	n	)	 9.00

### Chrome Brick Per Net Ton Standard or chemically bonded, Balt., Plymouth Meeting and Chester .....\$54.00

### Magnasita Brick

mugnesite	Drice	K		
Standard,	Balt.	and	Chester	 . \$76.00
Chamically	hond	hol	Daltimore	es 00

### Grain Magnesite

Domestic,	f.o.b.	Balt.	and	Chester	
in sacks	(car	loads)		\$	44.0
Domestic,	f.o.b.	Chew	relah,	Wash.	
(in bulk	()				22.0